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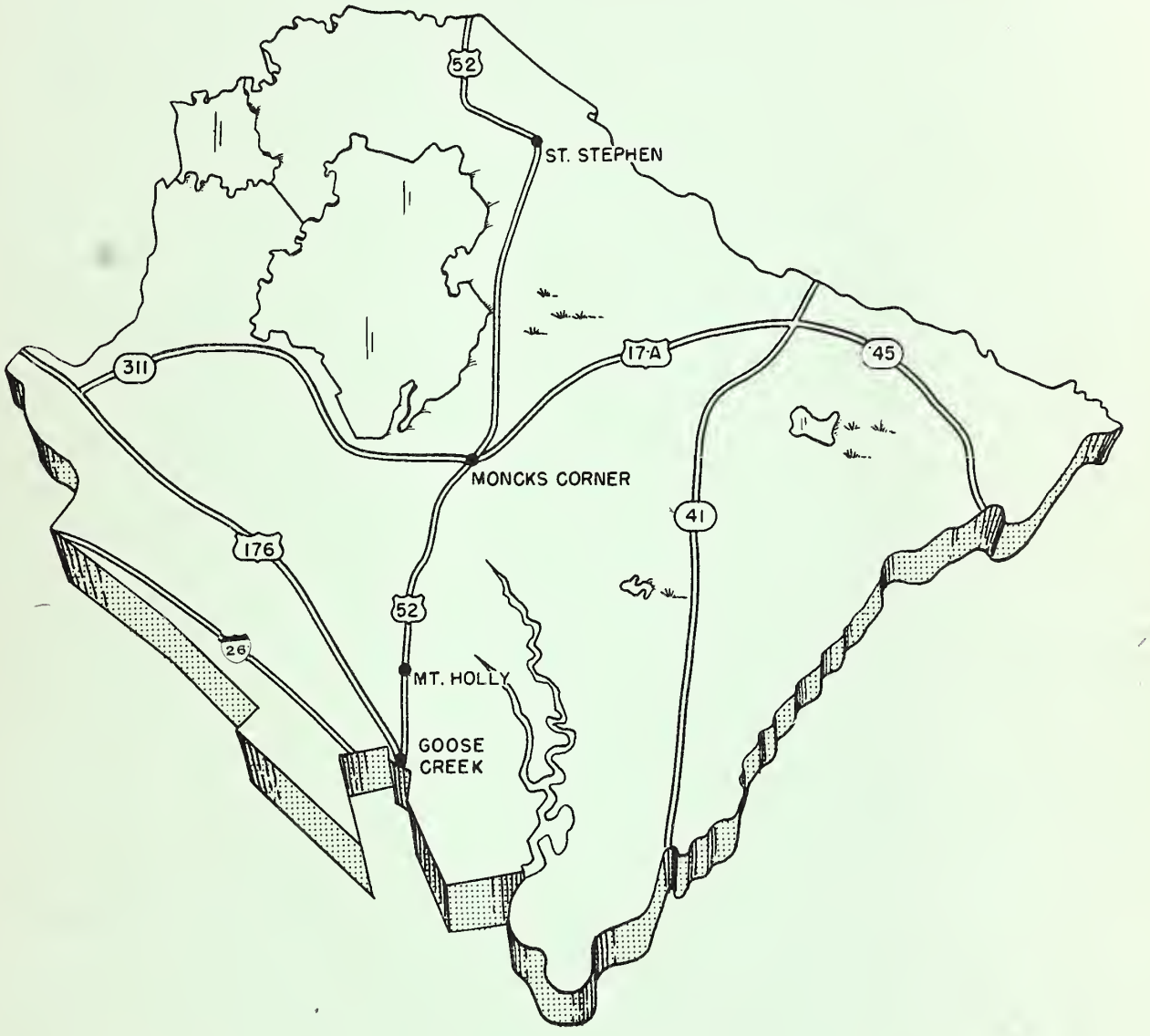
FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS



BERKELEY COUNTY, SOUTH CAROLINA

Prepared under sponsorship of
BERKELEY COUNTY
and
BERKELEY SOIL CONSERVATION DISTRICT
in cooperation with the
U. S. Department of Agriculture
Soil Conservation Service
U. S. Forest Service

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Foreword

The interrelationship of man, water, and land has always been an important factor in the development and growth of any community. In Berkeley County, South Carolina, the absence of a well defined drainage pattern has hampered the proper development of this relationship.

The feasibility study of requirements for main drainage canals in Berkeley County is the outgrowth of interest on the part of the county authorities and the Berkeley County Soil Conservation District Supervisors who, through their foresight, saw the need of such a plan in order to enhance the potential development of the county. This plan, as developed, is a direct result of such foresight. It is the first step toward solving the drainage needs of the county, which is recognized by all concerned as a problem of first priority. Agencies at all levels of government - local, county, state, federal - as well as private enterprise and numerous individuals, cooperated in the development of the plan. The Berkeley County delegation contributed largely to the cost of the project, including the publication of this report; technical assistance was furnished by the Soil Conservation Service.

The plan will provide a firm basis for action by county officials in determining needed legislation and methods of financing the necessary drainage improvements as well as establishing priorities of work. The cooperation of other agencies, groups, and individuals in the use of the plan also will be encouraged.

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FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS BERKELEY COUNTY, SOUTH CAROLINA

Introduction and Scope

The Feasibility Study of Requirements for Main Drainage Canals in Berkeley County is the logical first step toward solving the excess water problem. The purpose of the study is to point out the extent and severity of the drainage problem in the county and to furnish a guide to determine the physical feasibility and the estimated cost of the needed improvements. To accomplish this purpose, a system of main drainage canals has been developed for the major watersheds of the county and a discussion of some of the principal criteria used in design given.

The data in this report are based on reconnaissance surveys, information presently available, and on knowledge gained by long experience in planning and establishing drainage facilities in the county. The data are adequate for the purpose of determining preliminary design and cost estimates but are not adequate for the preparation of final construction plans, designs, and costs. The data herein presented, however, can be used by qualified engineers as guides in securing detailed information for these purposes. Included also are technical references which can supply information for the final engineering investigations, plans, and designs.

The use of most of the land in Berkeley County is dependent on adequate drainage. The lack of drainage is the principal detriment to the development of the land resources of the county. It results in frequent and costly crop damage on agricultural land and to property damage and disruption of facilities, both public and private, in urban and industrial areas.

The need to reduce flooding through improvement of drainage is recognized as a problem of first priority.

SC-2033-1

AGREEMENT SIGNED--Senator Rembert C. Dennis signs an agreement for the publication of the Feasibility Study of Requirements for Main Drainage Canals in Berkeley County. Looking on, left to right are: H. H. Harvey, Jr., Chairman, Board of Soil Conservation District Supervisors; H. N. West, Member of Berkeley County Delegation; Clyde D. Umphlett, Berkeley County Supervisor; Henderson Guerry, Member of Berkeley County Delegation and Dr. T. S. Buie, State Conservationist, Soil Conservation Service, who also signed the agreement.

Photo by Maxie Roberts
The State-Record Company, Columbia, S.C.

Factors Affecting Drainage

Berkeley County is located in the southeastern part of South Carolina near the Atlantic Seaboard, The southern part of the county is about 5 miles from the Atlantic Ocean. The physical features of the county, including topography, tidal ranges, rainfall, soils, and land use changes, result in complex drainage problems. All of these are inter-related. A brief discussion of how the physical features affect drainage follows.

Topography

Topography is a severely limiting factor affecting drainage. The land is generally level with slight undulations. Sharp breaks in topography occur along tidal streams and marshes. Elevations in the county range from mean sea level to 105 feet above mean sea level, with most of the drainage problems occurring between the 5- to 40-foot contour. The southern part of the county outlets into tidal creeks, which are subject to tidal fluctuations. The natural interior drains in most cases outlet into these streams at a higher elevation, which minimizes the effect of tidal changes. The natural drains are broad, have flat grades, and are heavily vegetated. In their natural state, little or no channel exists, causing extreme ponding in depressed areas.

Tidal Ranges

The tidal effects along the rivers in the southern part of the county are very complex, and highly variable, dependent on the force, direction, and duration of winds and other weather events occurring seaward. Predicted or normal range of tides above mean low water, with no consideration of wind effects, is 5.2 feet, with spring tides ranging to 6.8 feet. However, daily tide records maintained by the U. S. Weather Bureau, Charleston, S. C., show that there is considerable variation between the predicted and actual tide ranges due to wind. Generally, tide heights have a departure of 1.0 - 1.5 feet below normal. Storm tides which occur when sustained winds along the coast exceed 40 miles per hour have a departure from normal of 2.5 to 3.0 feet above normal. A thorough knowledge of tidal action is essential in proper planning and design of drainage systems and supporting structures.

Rainfall

U. S. Weather Bureau Records, Table No. 1, shows monthly and yearly rainfall records for Pinopolis Dam, South Carolina Public Service Authority's Hydro-Electric Plant near Moncks Corner, South Carolina. The average yearly

TABLE NO. 1
RAINFALL DATA - U. S. WEATHER BUREAU
PINOPOLIS DAM, S.C.

TOTAL PRECIPITATION

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1931	3.55	0.80	3.82	2.25	8.47	4.18	3.97	1.97	0.25	0.20	0.09	4.02	33.57
1932	2.33	3.35	1.56	1.27	6.18	12.25	0.95	--	4.89	5.93	--	1.20	--
1933	3.34	5.64	1.63	2.47	1.62	4.79	--	--	1.36	1.58	1.75	0.00	--
1934	0.93	3.99	1.67	1.73	1.57	2.20	--	7.95	3.58	2.52	2.49	1.20	--
1935	1.26	1.69	1.78	2.54	5.11	2.23	8.56	5.50	8.06	1.95	1.90	2.96	43.54
1936	3.96	4.62	--	4.32	1.10	4.39	6.78	4.03	1.95	10.64	0.46	5.09	--
1937	4.70	4.49	2.70	5.85	1.05	5.23	5.80	7.61	4.83	2.22	3.90	2.66	51.04
1938	0.80	0.81	0.50	5.56	3.52	3.10	3.70	2.01	5.52	1.40	0.88	1.99	29.79
1939	2.84	8.79	3.69	2.60	5.10	5.62	2.79	6.88	1.24	0.68	0.32	2.00	42.55
1940	4.43	6.00	3.50	1.71	5.64	4.36	4.09	12.70	2.05	0.15	1.59	2.87	49.09
1941	1.05	1.76	5.31	3.10	T*	9.81	8.63	3.96	1.04	0.18	1.26	7.16	43.26
1942	1.40	--	6.37	1.68	2.23	6.46	3.49	--	2.82	0.11	--	2.95	--
1943	2.84	0.98	6.74	2.92	2.17	--	6.38	6.36	2.49	0.01	1.50	3.32	--
1944	3.41	5.22	9.34	3.07	1.60	1.31	2.41	1.64	4.24	6.51	1.39	0.85	40.99
1945	1.52	3.53	1.47	1.98	2.89	5.75	10.98	6.91	17.36	4.02	1.42	5.57	63.40
1946	3.69	1.96	4.13	3.04	5.39	1.63	6.94	3.44	1.93	3.73	2.32	0.50	38.70
1947	3.87	0.18	6.31	4.37	6.32	3.75	8.00	6.07	7.23	2.67	4.94	4.73	58.44
1948	3.48	5.62	7.60	3.33	4.95	1.32	6.77	5.54	6.03	2.49	7.70	3.90	58.73
1949	0.72	6.09	2.18	2.96	2.75	5.35	3.87	10.40	4.54	1.01	1.85	1.04	42.76
1950	0.48	0.81	4.38	2.00	4.01	3.16	7.52	6.56	7.67	3.25	1.23	4.64	45.71
1951	1.31	1.17	3.39	1.62	0.89	6.58	6.88	3.65	1.76	0.65	2.95	2.21	33.06
1952	1.10	5.22	5.67	2.72	3.95	2.24	6.91	10.65	8.21	1.95	2.08	2.35	53.05
1953	0.87	6.00	4.63	0.82	3.08	4.33	5.27	8.26	5.37	1.45	2.13	7.06	49.27
1954	1.40	1.13	1.70	3.52	3.25	0.57	1.71	2.77	1.45	3.03	1.11	2.50	24.14
1955	3.77	1.28	1.21	3.08	6.67	5.90	5.62	11.44	7.91	1.05	2.60	1.74	52.27
1956	1.77	4.69	3.17	2.10	3.21	2.95	4.16	7.81	4.15	4.09	0.54	0.98	39.62
1957	1.66	2.03	5.09	0.95	5.98	4.62	4.04	5.50	7.26	1.13	3.95	2.60	44.81
1958	5.21	3.78	5.64	9.40	5.38	13.65	8.26	6.23	1.16	5.34	0.50	3.24	67.79
1959	3.75	4.88	7.66	2.30	2.62	2.01	14.41	3.53	8.75	8.69	1.26	2.74	62.60
1960	4.00	4.61	3.74	2.53	1.85	6.80	10.88	3.72	7.33	1.23	0.73	2.05	49.47
1961	2.23	4.55	2.64	8.36	4.43	3.42	4.82	8.43	3.33	1.39	1.50	2.11	47.21
1962	4.87	2.58	6.61	3.81	1.09	6.50	5.04	6.93	5.91	1.58	2.68	1.61	49.21
Average Rainfall	2.58	3.49	4.06	3.10	3.68	4.72	5.99	6.15	4.74	2.59	1.97	2.81	46.70

In the above table information shown from January 1931 to June 1943 is taken from Pinopolis weather station. From July 1943 to December 1962 information shown is taken from the weather station at Pinopolis Dam.

T* means Trace - not enough to measure.

-- No record available.

PRECIPITATION EXTREMES

	Maximum Monthly	Year	Minimum Monthly	Year
January	5.21	1958	0.48	1950
February	8.79	1939	0.18	1947
March	9.34	1944	0.50	1938
April	9.40	1958	0.82	1953
May	8.47	1931	T*	1941
June	13.65	1958	0.57	1954
July	14.41	1959	0.95	1932
August	12.70	1940	1.64	1944
September	17.36	1945	0.25	1931
October	10.64	1936	0.01	1943
November	7.70	1948	0.09	1931
December	7.16	1941	0.00	1933

T* means Trace - Not enough to measure.

RAINFALL IN INCHES FOR SELECTED DURATIONS*

	30 Min.	1 Hour	2 Hours	3 Hours	6 Hours	12 Hours
1 Year	1.4	1.8	2.1	2.3	2.6	3.1
2 Years	1.6	2.0	2.4	2.7	3.1	3.6
5 Years	2.0	2.5	3.1	3.4	4.1	4.8
10 Years	2.3	2.9	3.5	3.9	4.6	6.2
25 Years	2.5	3.3	4.2	4.5	5.7	6.5
50 Years	2.9	3.7	4.5	5.1	6.2	7.2
100 Years	3.2	3.9	5.1	5.6	6.7	8.2

* U. S. Weather Bureau Technical Paper No. 40 - "Rainfall Frequency Atlas of the United States"

rainfall of 46.70 inches would not cause a serious drainage problem if it were evenly distributed. The most serious drainage problem in areas along the tidal creeks is created by the high intensity, short duration rain storms occurring during periods of high tides and prevailing easterly winds. Also, Lake Moultrie, in the northern part of the county, creates a drainage problem due to its elevation and the topography of the surrounding areas. The design of drainage systems and supporting structures is related to the amount of runoff that can be expected from storms of differing intensities and durations.

SC-1940-5

ROAD FLOODED--Heavy rains flooded section of county road in intensive farming area near St. Stephen, S. C. Adequate outlets would have carried off excess water.

SC-1940-9

HOME AND LAND FLOODED--Causing crop and property damage in Russellville section of Berkeley County.

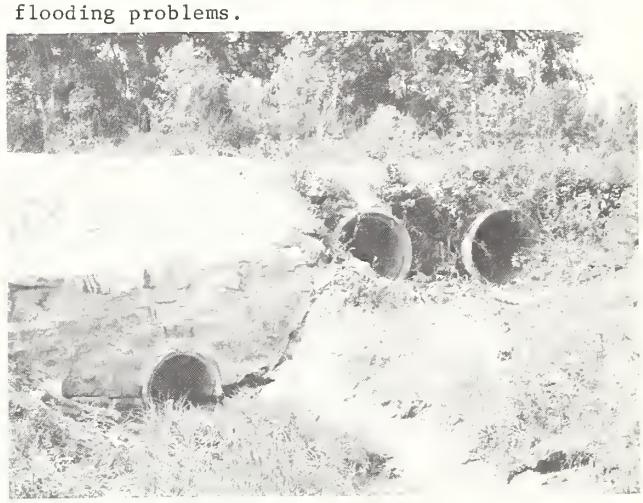
Soils

A description of soil associations in Berkeley County is contained on pages 13 to 16. Soils have characteristics which decidedly influence the need for, and the degree of, drainage. Some of the more important characteristics are: depth, infiltration, permeability, texture, structure, water-holding capacity, water-table depth, and slope. A knowledge of these characteristics, as well as of the engineering properties of soils, is essential in planning, designing and constructing an adequate drainage system. Fine (clayey) textured soils have little or no subsurface water movement and can be drained only by removal of surface water by means of shallow surface ditches. Sandy soils, having high water tables or fluctuating water tables, respond to sub-surface drainage, but present problems in the design of open ditches. These problems include: (a) side slope sloughing, which limits depth of cuts; (b) limitation of the velocity of flow; and (c) sedimentation.

Culverts

Culverts for road and railroad drainage generally lack capacity to handle runoff from high intensity storms and are frequently installed with invert elevations too high. They are a serious bottleneck to the rapid disposal of runoff and cause local flooding. The problem is less severe on primary roads than on secondary roads. Culverts are almost universally inadequate on unpaved and farm roads.

Drainage structures in driveways paralleling streets and roads in established subdivisions and towns are critical factors in contributing to poor local drainage. Head losses alone resulting from the widespread use of under-designed culverts in residential areas create local flooding problems.



UNNUMBERED PHOTOGRAPH

Two culverts on right were installed too high to provide adequate drainage. Culvert on left was added when new drainage canal was constructed.

Urbanization

Urbanization of areas around Moncks Corner, Goose Creek, and Hanahan is having an adverse effect on drainage. Some of the drainage facilities now in use were established to handle the agricultural needs of the area. They are not adequate to handle runoff resulting from urbanization. Roof tops, paved roads, compaction, raised water tables resulting from septic tanks and tile field installations, grading and elimination of some ditches during urban development, have created conditions approaching 100 percent runoff. As urbanization continues, the present drainage facilities will become increasingly inadequate to handle runoff.

There is a need for regulations to insure that adequate drainage canals and drainage structures are installed as these areas develop.

SC-1188-9

Flooded streets and homes in subdivision following heavy rains. Adequate drains are needed.

Existing Drainage System

With the exception of some recently excavated canals, drainage systems in rural and urban areas are generally inadequate in depth and capacity, and have very flat grades. An important additional factor contributing to this problem is the lack of legal authority to secure adequate rights-of-way for proper ditch design, spoil management, and access for maintenance. Rights-of-way in the past were usually limited to the width which the landowner was willing to donate, which in most cases was less than thirty feet.

Existing flat grades are the result of discharging canals - (1) into tidal marshes at mean sea level elevation rather than at mean low water elevation, or (2) discharging into swamps which are not adequate outlets in their present state since they generally pond water for long periods of time following heavy rainfall.

Existing canals are usually located in natural water courses. However, in many instances alignment is poor, since attempts were made to accomodate the canals to existing property lines or other physical features inconsistent with good channel flow conditions.

Maintenance

Lack of adequate maintenance is a factor which affects the capacity of canals. The existing drainage canals in most of the county were dug by hand many years ago; some of them were enlarged by the Works Progress Administration in the 1930's. They have nearly vertical side slopes, with spoil placed immediately next to the ditch. Practically all canals have high spoil banks which are covered by heavy growth of trees and brush, making access very difficult. Continuous spoil banks for long distances prevent surface drainage from adjacent areas and result in ponding. The extent of machine maintenance is limited at present, due to these conditions and also to the lack of legal easements permitting access.

Drainage Principles

The purpose of this report is to present a plan for the location and needed capacities of main drainage canals. This is, however, only the first step in the establishment of a complete drainage system. Drainage systems are divided into two broad categories - surface drainage, and sub-surface drainage.

Surface Drainage

Surface drainage removes excess water, by gravity, from the land surface to an outlet. Surface water can best be moved by shallow channels or by grading the land surface to a uniform slope primarily on cultivated land. To insure water movement along the surface to an outlet without ponding is a very important function of the drainage system. Surface drainage facilities are particularly applicable to soils having slow permeability rates, to the drainage of low pockets to prevent ponding, and to the diversion of water from protected areas. Also, they collect and convey water to natural channels or to constructed channels.

Sub-surface Drainage

Sub-surface drainage removes water from beneath the surface of the soil by facilities which create a difference in hydraulic head. The resulting hydraulic head causes water to move through the soil to an outlet. Sub-surface drainage may be accomplished by open ditch drains or by tile drains. Open ditch drains have an added advantage because they can also collect and remove surface water. Tile drains, with certain precautions, can remove surface water by simulating a small storm sewer system.

The purpose of sub-surface drainage is to lower the water table to a point where it will not interfere with plant growth or the use of the land for residential or other purposes. The minimum depth below the surface at which water tables should be maintained depends on the use of the land. Water tables, fluctuating upwards to or near the surface, may not be as great a problem in agricultural areas as they would be in populated areas.

The Drainage System

The components of a Drainage System are as follows:

The Collection System - is that part of the drainage system which first picks up water from the land. It may consist of shallow trapezoidal ditches, having flat side slopes; V or W type ditches, bedding, or grading the land surface in urban areas. This is a part of the drainage system which cannot be neglected if the system is to perform adequately.

The Disposal System - receives water from the collection system and conveys it, usually in an open channel, to the outlet. Generally, this report concerns itself with this part of the drainage system.

The Outlet - is the end point of any segment of a drainage system beyond which the ditch, storm sewer, or the system no longer guides or controls the water it discharges.

Drainage Requirements

The drainage system should be designed to prevent flooding in critical parts of the watershed for a period of time sufficient to cause

damage or disrupt utilities and services. For urban areas, design should provide for the removal of runoff from the design storm with a minumum of flooding. In agricultural areas, the degree of protection required by crops varies considerably, depending on their tolerance to the amount and duration of excess water. Truck crops are the most susceptible to damage from excess surface water, some of which occurs when they are flooded for the relatively short period of 24 hours or less. General crops such as corn and grain are not as susceptible to damage as truck crops, and pasture is still less susceptible to water damage. Woodland areas are the least subject to damage from flooding for prolonged periods.

Poorly drained soils adversely affect the use of the land for most purposes. On agricultural land, high water tables restrict root penetration; soil temperature is lowered, air circulation is severely limited, dependent on the degree of soil saturation. Wet spots in the field delay farm operations and shorten the growing period.

Poorly drained soils in residential areas, in addition to their effects on ornamental plants and lawns, adversely affect the construction, maintenance, and use of roads and streets. They also limit or prohibit the development of some areas, preventing the proper functioning of septic tank tile fields, and contribute to health hazards.

SC-1192-1

Flooded corn field caused by lack of proper drainage.

SC-1956-1

FLOODED FIELD--Water standing on field like this makes cultivation difficult.

Design Criteria

The design of drainage systems and supporting structures is based on Hydrology and Hydraulics and this report will limit itself to the application of these sciences as they apply to the solution of such problems. References for more detailed information on design of open channels, closed conduits, culverts, dikes, pumps, tide gates, and other engineering structures ultimately involved in establishing a drainage system are listed on pages 21 - 75.

Drainage Coefficients

The drainage coefficient is the rate of removal of runoff to provide a specific degree of drainage protection to an area. Land use, soils, topography, and rainfall intensities and duration determine the selection of drainage coefficients. A series of four curves have been developed from which required drainage capacities of open ditches can be computed, dependent on the land use. (See Figure No. 1) The highest curve is for urban use followed in descending order for truck crops, general crops, and woodland.

The use of these curves provides for the removal, in 24 hours time, of the following amounts of runoff:

Urban curve	- 4.39 inches
Truck crops	- 3.33 inches
General crops	- 1.67 inches
Woodland	- 0.37 inches

The curve for urban areas reflects a peak runoff for a 10-year frequency.

Velocity

Soil characteristics, the shape of the channel, and available means for stabilization of the soil after construction, determine the maximum safe velocity. The optimum velocity for channels, based on soil conditions in Berkeley County, is approximately 2 feet per second. The soils are predominately fine sands. Sedimentation occurs when velocities are less than 1½ feet per second which is frequently caused by vegetative growth. Erosion will occur in most soils at velocities in excess of 3 feet per second. Design of channels in the fine, water bearing sands must consider the need for checking erosion and bank caving that will occur immediately following construction when water tables are high.

Velocities should be designed after a thorough investigation of soil conditions to the depth of proposed channels.

Channel Cross Section

Values of Roughness Coefficient "n"

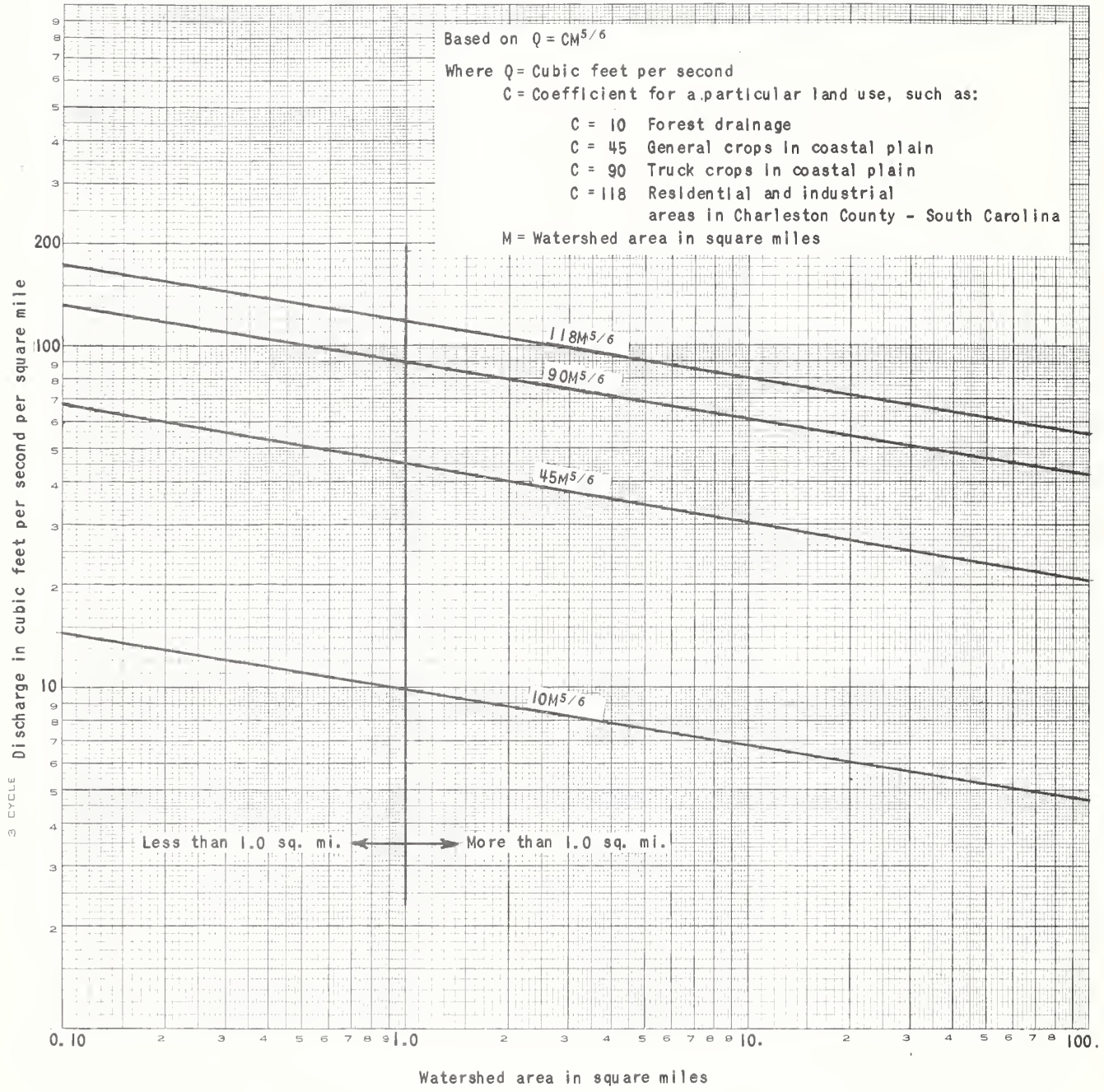
All channel cross sections were computed by use of Manning's formula for determining velocities. This is:

$$V = \frac{1.486}{n} \times r^{2/3} \times s^{1/2}$$

where: n = Roughness coefficient
r = Hydraulic radius
s = Slope in feet per foot along the ditch

The proper design of a ditch cross section required the selection of the proper value of "n". Side slopes of the ditch as well as depth and allowable velocities are fixed primarily by soil conditions and proposed maintenance methods.

Figure No. 1 - Drainage Coefficient Curves



The following tabulations were used for selection of values of "n" for Manning's formula in the design of main canals with good alignment:

Hydraulic Radius*	"n"
Less than 2.5	.045
2.5 to 4.0	.040
4.0 to 5.0	.035
over 5.0	.030

* The hydraulic radius is obtained by dividing the proposed area of the channel cross section by its wetted perimeter.

In newly dug channels, roughness is lower and velocities higher. A realistic roughness coefficient was selected anticipating flow retardance features, such as vegetative growth and sediment several years after construction. Where the design velocity was near an erosive value, corrective measures were planned.

SC-464-11

These two draglines are in process of construction of a major drainage canal. This picture shows the need for adequate cleared right-of-way in which to dig the required canal and, also, provide sufficient space for the excavated soil.

Channel Depth and Width

Depth of channel is an important design consideration. The channel must be deep enough to tap and provide for the escape of ground water, and to provide for the safe entrance of the longer lateral ditches and tile drains. Other considerations favoring a deeper channel with a resulting narrower bottom width are: less right-of-way is required, vegetative growth on the wetted perimeter is reduced, and conditions are less favorable for the formation of sandbars. A channel roughly as deep as its bottom width - within economic limits - will remain effective for a longer period because it has most favorable hydraulic characteristics.

A minimum bottom width of 3.0 feet was designed for main channels, which conforms to a bucket width of small dragline excavating equipment. Bottom widths were selected as narrow as design and construction criteria would permit, so as to obtain higher velocities which, in many instances due to low gradients, were not high enough to prevent formation of sediment islands and growth of vegetation in channel bottoms.

Side Slopes

Maintenance methods, soil characteristics, and a need for adequate but economic minimum rights-of-way determined the side slopes of channels. Side slopes of 1 to 1 for main channels were used to satisfy these conditions.

In fine sands having high water tables, sloughing of side slopes may be expected immediately after excavation. Sloughing will continue until the water table becomes established at the lower level. The problem can be controlled somewhat in wide channels by requiring initial construction of a pilot channel to lower the water table followed by final construction when the channel has been stabilized; or by requiring a maintenance operation to restore design cross section soon after the channel has been stabilized.

Design at Culverts

Culverts obstruct the flow of water in ditches and cause a loss in head. This was considered in designing main channels. The hydraulic gradi-

LATERAL CANAL--This canal shows importance of good construction, alignment and spoil management. SC-979-6

ent, in most cases, was set low enough to keep the profile of the water surface at the culvert during design flow well within the channel cross section in all critical areas.

Talbot's formula was used in determining culvert sizes, at the suggestion of the Berkeley County Road Department, since it is their policy and the policy of the South Carolina State Highway Department to use this formula in culvert design. Talbot's formula is as follows:

$$A = C \ 4 \ M$$

where: A = Necessary waterway in square feet
M = Area drained in acres
C = Coefficient (.2 used)

Where culvert sizes exceed 60 inches in diameter, it was found more economical to use 15-foot bridges.

Right-of-way Requirement - Berm Width, Spoil Bank

Factors governing width of rights-of-way can best be understood by consulting Figure No. 2. The principal requirements for berm width include a work area for spoil shaping so as to prevent erosion or spoil material sliding into the canal, provide a way for travel by maintenance equipment, and reduce the load near the edge of ditch banks to prevent sloughing. Where unstable soil conditions require it, and the problem of securing wide easements is not a factor, a 15-foot berm width is optimum. Narrower berm widths are feasible where the spoil is to be shaped and a roadway established on top of the spoil.

Dikes, Conduits and Pumps

Needs and Location

An integral feature of the water disposal plan is the establishment of dikes across tidal inlets at selected sites to control tidewater intrusion into the major outlets, and provide a basin behind the dike for runoff storage during periods of high tides and high intensity rainfall. Where the capacity of the storage basin is sufficient to store runoff water during a short-duration storm occurring at high tide, the runoff water can be discharged, during the low tide cycle, through conduits equipped with tide gates or through a low gravity flow section through the pump structure. However, where the storage is limited, the storms prolonged, and prevailing winds result in a relatively high tide level, pumps will be required to maintain a safe level of water in the storage basin to prevent damage in highly developed residential areas.

The combination of dikes, tide gates, and pumps will provide protection during times when the drainage canals cannot discharge by gravity. These conditions occur frequently enough to justify the cost. It is during these times that extensive property damage occurs, usually with resultant disruption of public facilities. (See Figures 3 and 4)

Design Criteria

Available records indicate that average storm tides (excluding hurricane tides) occur at 8.0 feet above mean low water. Design of dikes,

Figure No. 2 - Typical Main Ditch Cross-Section Showing Basis For Determining Right-Of-Way Width

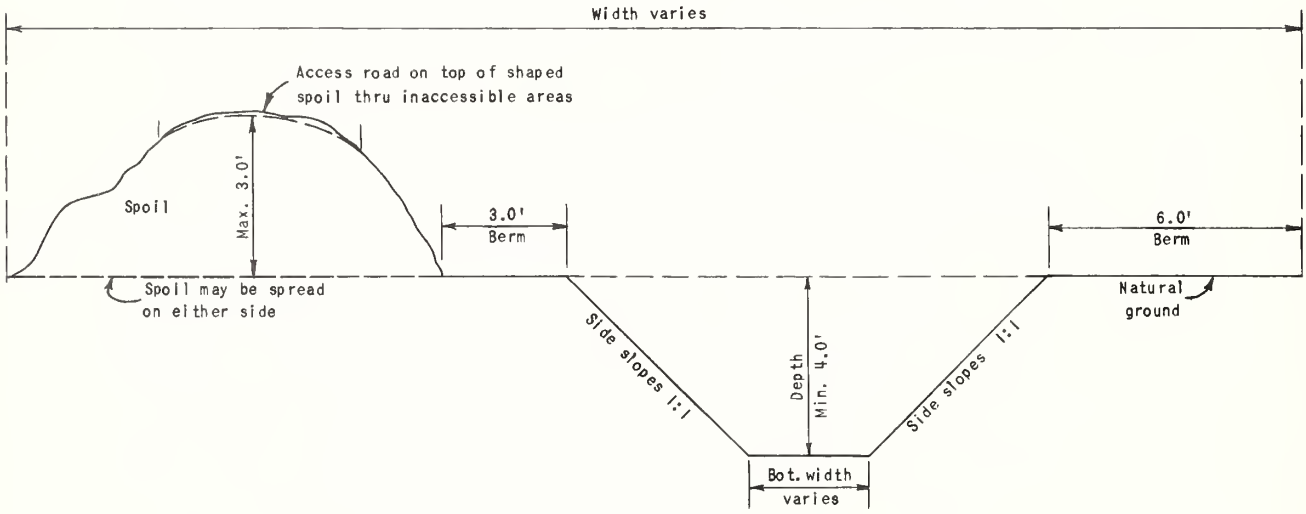


Figure No. 3 - Typical Profile and Cross-Section - Dike and Pump Structure

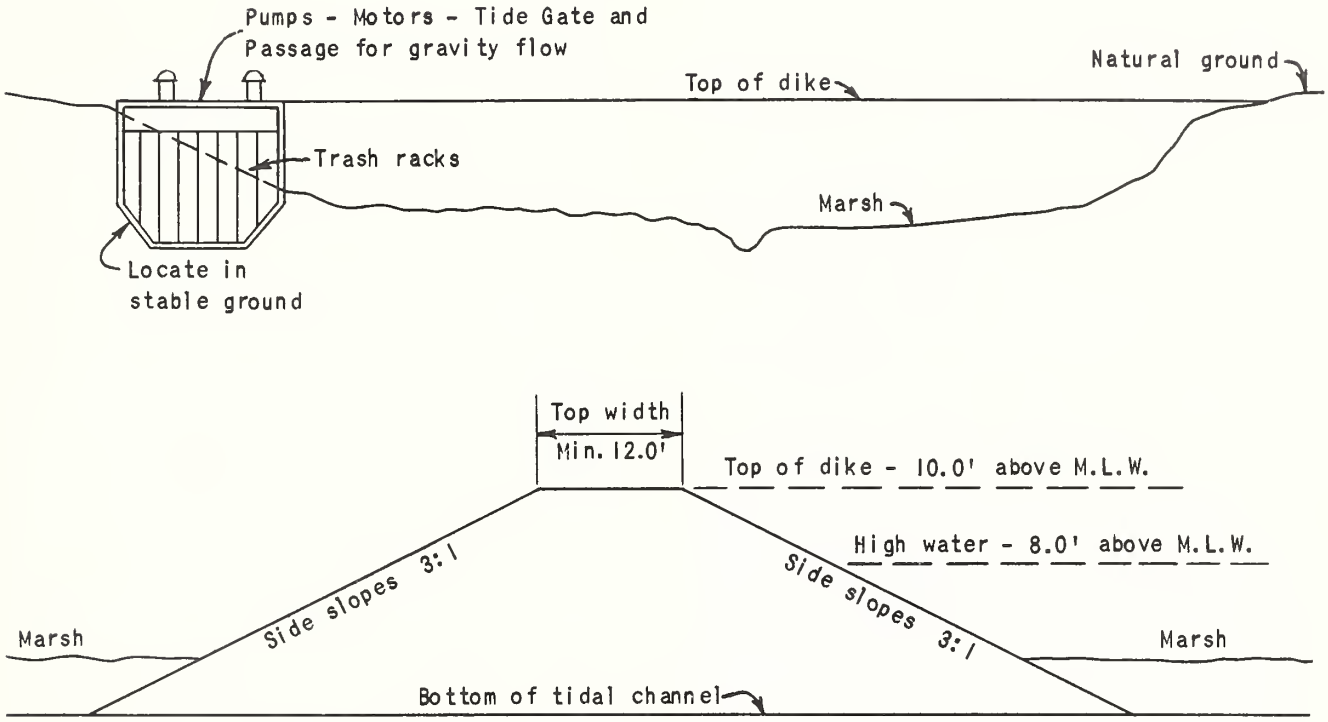
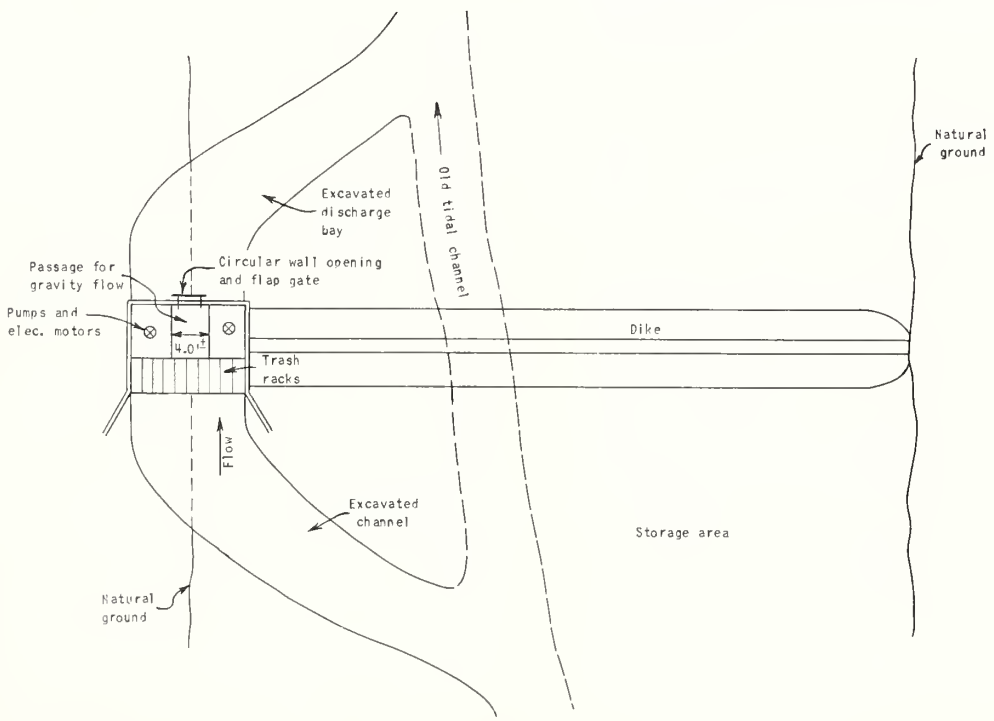


Figure No. 4 - Plan View Showing Typical Installation of Dike - R/C Pump Structure - Tide Gate and Channels



with top elevation of 10.0 feet above mean low water, 3:1 side slopes and 12.0-foot top width, is considered a minimum requirement for adequate protection.

Pumping lift, topography, and foundation conditions are factors which influenced the location of pumps. The axial flow or propeller-type pump was used in determining costs since it is especially adapted for low head pumping.

Three pumps are used for each installation with each pump having one-third the total needed capacity. Adequate trash racks, suction bays, discharge bays, and low-flow gravity chambers are planned.

Reinforced concrete structures for pumps, gates, conduits and trash racks are planned to be located at abutment ends of dikes where good foundation conditions exist. Pumps are planned at an elevation sufficient for protection from inundation during abnormally high tides. Locations are also planned for ease of access and maintenance. (See Figures 3 and 4)

NC-323-7

Low head drainage pumps and reinforced concrete pump structure and trash racks.

Description of Areas

These areas are the 13 major watersheds in the county. A brief description of drainage problems associated with each area follows.

Area 1 - Hanahan - Goose Creek - Carnes Crossroads - Oakley

This area, in the southern part of the county, and adjoining North Charleston, is one of the fastest developing areas in the county. It is rapidly changing from agricultural and woodland to residential and industrial use. Bordered on the east by the Cooper River, the land adjacent to the river is being rapidly developed into defense installations by the U. S. Navy. The influx of personnel caused by the U. S. Navy's expanding building programs has created a rapid development of residential and shopping areas. Installation of adequate drainage systems in this area should proceed as rapidly as possible in order to stay ahead of the rapid urbanization of the area. This will reduce the cost, and eliminate some serious right-of-way problems which might develop. Encroachment of developments on areas exposed to storm tides makes special protective measures such as dikes, tide gates and pumps desirable.

Area 2 - Moncks Corner - Oakley

This area, bounded on the east by the Cooper River and on the north by Lake Moultrie, is one of the most thickly populated areas in the entire county. It includes the town of Moncks Corner, which is the county seat of Berkeley County. The rural part of the area is primarily devoted to agriculture, with a few private tracts of woodland. All drainage in this area flows into the Cooper River since the elevation of Lake Moultrie allows practically no drainage in that direction.

The soils in this area vary from well drained on the higher ridges to very poorly drained along the Cooper River. The subsoils are generally rather tight, allowing slow movement of internal water. In drainage canal design the difference in elevation is such that no difficulty is experienced in securing satisfactory grades in moving water to satisfactory outlets.

Area 3 - Wassamassaw - Cooper's Store - New Hope - Lebanon

Area 3, containing approximately 140 square miles, is the largest watershed area in the county. The entire watershed drains into Cypress Swamp which is the headwaters of the Ashley River. The greater part of this area is woodland, with ownership vested in a Pulp and Paper Company, and other private owners. There are also extensive farming areas in the New Hope and Lebanon sections along the east and west sides of Cypress Swamp.

The soils, excluding the swamp and depressed or bay areas, are among the best in the county and are fairly easily drained. In the woodland areas, some drainage facilities have been installed by a Pulp and Paper Company. These facilities, which provide for drainage and also access roads, are considered adequate in most instances. This area contains several large depressed or bay areas. Some of these are Mosquito Bay, Caton Bay, and Black Tom's Bay. Improved drainage is needed in this area in order to improve agricultural and timber production.

Area 4 - Sand Ridge - Pringletown

This area is in the extreme western part of Berkeley County and is bounded on the west by Four Hole Swamp. It contains several rather small watersheds which drain into Four Hole Swamp. The topography is rather flat with sharp breaks occurring along the edge of the swamp basin. Drainage is, generally, not difficult to obtain as there is usually enough fall in the natural main outlets to obtain satisfactory grades.

Also, this area contains some of the highest land in the county, at one point reaching to an

elevation of approximately 100 feet above mean sea level.

The soils here range from loamy sands on the ridges to sandy loams in the low areas. Internal drainage is satisfactory when adequate outlets are provided.

The area is approximately 60% woodland and 40% cultivated land. Pulp and paper companies own about 60% of the woodland with individual land owners controlling the rest. The agricultural land is devoted to production of several crops such as cotton, corn, tobacco, grain, and pasture.

Area 5 - Cross

Area 5 is largely agricultural. With the exception of woodland areas in the southern part, it is devoted almost entirely to the production of farm crops. Some truck crops are grown, such as beans, potatoes, and cucumbers. Bounded on the north by Lake Marion, and on the east by Lake Moultrie, adequate drainage is difficult to obtain, due to the elevation of the waters in these lakes. The topography is flat and contains many small, shallow bay areas from which surface water cannot escape.

The surface soils range from loamy sands to sandy loams with sandy clay sub-soils. The high water table establishes the need for extensive drainage if cultivation requirements are met and maximum crop yields produced.

Area 6 - Eadytown - Pineville - St. Stephen

This area contains the highest concentration of farms in the county. It is almost entirely agricultural except for the areas along the edge of the Santee River Swamp. Crops grown include: cotton, corn, soy beans, tobacco, and small grains. Some truck crops, including potatoes, beans, and cucumbers, also are grown.

The area is bounded on the north by the Santee River and on the south by Lake Moultrie. A dike along the north side of Lake Moultrie does not allow any drainage into the lake. Therefore, all drainage in this area has to flow north into the Santee River Swamp. Due to the favorable contour of the land, good main outlet canals can be provided in most cases. An exception to this is a small area south of Eadytown and west of the old Santee Canal. Here it will be necessary to dig through a fairly high ridge in order to drain into the Santee River basin.

Area 7 - St. Stephen - Alvin - Jamestown

Area 7 is bounded on the north by the Santee River. All lands in this area drain into this river or its tributaries. The individual watersheds are comparatively small and the required main canals and laterals are, also, comparatively small. The somewhat rolling land and the difference in elevation between the upper and lower ends of the natural draws allow sufficient grades for the proposed canals to remove excess water satisfactorily.

This area is approximately 85% woodland and 15% farm land. National Forest Lands make up approximately 50% of the woodlands, with Pulp and Paper Companies and individuals owning the remaining 50%.

The soils in this area are rather tight, and internal drainage is slow, especially in the low areas. Adequate drainage is necessary for maximum crop production.

Area 8 - Russellville - Bonneau - Macedonia

This area is located in the north central part of Berkeley County. The northern boundary is roughly a line running east from Russellville through St. Stephen to a point 5 miles east of St. Stephen. The western boundary is a dike along the east side of Lake Moultrie. All drainage in this area flows south into Wadboo Swamp and eventually into the West Branch of the Cooper River. The topography is rather flat but there is sufficient fall in the natural drainage pattern to obtain satisfactory drainage.

The soils range from well drained on the ridges to very poorly drained in the lower areas. Most of these soils have good internal drainage when adequate outlets have been provided.

Cultivated land makes up approximately 20% of the area with the remaining 80% in woodland. National Forest lands make up approximately 50% of the woodland areas.

Area 9 - Macedonia - Bethera - Gough

Approximately 75% of this area is National Forest land and is owned by the Federal Government. About 20% is also in woodland owned either by Pulp and Paper Companies or other private landowners. The remaining 5% is cultivated or pasture lands.

All drainage in this area runs into Wadboo Swamp which is the headwaters of the western branch of the Cooper River. Adequate drainage canals will not be difficult to construct due to there being sufficient fall in the existing natural drains.

The soils are moderately to poorly drained with the better soils occurring along the higher ridges.

Area 10 - Childsbury - Cordesville - Witherbee

For the most part, this area is totally devoted to timber productions. The only exceptions to this are several plantations along the Cooper River and small farms along the main roads such as State Routes 402, 171, and 44.

Most of the land in this area is privately owned either by individuals or by Pulp and Paper Companies. An exception to this is a portion in the northern section which is within the National Forest boundary.

These lands and tidal rivers and creeks furnish an abundance of recreational activities. The woodland areas contain excellent deer, quail, and turkey hunting, while the river and creeks furnish some of the best fishing available. Considerable income is derived by the property owners from organized clubs who lease the property for hunting or fishing privileges.

The contour of the land is rather flat and

interspersed with numerous small bay and pond areas. However, the natural topography is favorable for the installation of needed drainage.

Area 11 - Jamestown - Shulerville - Honey Hill

This area is in the extreme eastern part of Berkeley County. It is bounded on the north by the Santee River and on the south and east by Wambaw Creek. These natural outlets receive all of the drainage from the entire area.

Timber growing is the source of most of the income produced here, about 95% of the total area being in woodlands. Farming is limited to small tracts of land located along State Route 45 from Jamestown to Honey Hill, and in the Shulerville section.

The soils vary from deep, wet sands along the higher ridges to loams with clay subsoils in the depressed bays. Good drainage is practically non-existent even in the farming sections.

A wildlife production and management project is located on a 16,000-acre tract of National Forest land along Wambaw Creek and the Santee River. The purpose of this project is to improve wild game hunting. It is jointly financed by federal and state funds and is administered by the South Carolina Wildlife Resources Commission and the U. S. Forest Service.

Area 12 - Bethera - Huger - Eccles Church - Green Bay

Area 12 presents one of the most difficult drainage problems in the county. The topography is generally flat with large, dense bay areas which have never been drained. Except for the slightly higher ridges surrounding these bays, the area is poorly suited to trees.

National Forest lands comprise approximately 85% of the area, with Pulp and Paper Companies and individual property holders owning the remaining 15%. Practically no farming operations are carried on.

A complete system of adequate main outlets and lateral canals needs to be constructed before the full production of the land capability can be reached. The soils are well suited to trees when proper drainage is furnished.

The three main drainage areas are Nicholson Creek, Turkey Creek, and Quenby Creek, all of which flow into the eastern branch of the Cooper River. Elevations are such that adequate drainage can be obtained.

Area 13 - Pompion Chapel - Charity Church - Wando - Daniel's Island

This area is in the southern part of Berkeley County. It is bounded on the west by the Cooper River, on the north by the east branch of the Cooper River, and on the south and east by the Wando River. The land is influenced greatly by the many tidal creeks which flow into both rivers. The southern part (Daniel's Island) is extremely low and flat, the average elevation being only 8 to 10 feet above mean low water.

The soils are generally poorly drained except those located on the ridges. Outlets have never been provided in most cases.

The area is almost entirely devoted to woodland. There is a small farming section near Charity Church and a few other scattered farms which are engaged principally in cattle growing.

Large, individually owned, woodland holdings make up about 85% of the area, with National Forest lands comprising the remaining 15%.

SC-808-7

Right-of-way clearing for Main Drainage Canal.

Soil Associations

Description of Soil Associations and Their Drainage Problems

After studying the soils in a locality and the way they are arranged, it is possible to make a general map that shows the main patterns of soils, called soil associations. Such a map is the general soil map in the back of this report. Each association, as a rule, contains a few major soils and several minor soils, in a pattern that is characteristic, although not strictly uniform.

The soils within any one association are likely to differ greatly among themselves in some properties; for example, natural drainage, texture, permeability, or slope. Thus, the general map does not show the kind of soil at any particular place, but a pattern that has in it several kinds of different soils.

The soil associations are named for the major soil series in them, but, as already noted, soils of other series may also be present. The major soil series of one soil association may also be present in other associations but in a different pattern.

The general soil map showing patterns of soils is useful to people who want a general idea of the soils, who want to compare different parts of a county, or who want to know the possible location of good-sized areas suitable for a certain kind of farming or other land use.

Soil Association 1 (Map Symbol 1)

Chewacla-Wehadkee association: Nearly level somewhat poorly drained to poorly drained soils on flood plains.

This association is a nearly level floodplain along the Santee River and occupies 4 percent of the county. The Chewacla soils are 10 to 20 inches higher in elevation than the Wehadkee soils. Chewacla soils comprise 60 percent of this association. They have brown silty clay loam surface layers and yellowish-brown to light yellowish-brown silty clay loam to silty clay subsoils. Wehadkee soils are in sloughs and drainageways and have dark gray silty clay loam surface layers and gray silty clay to clay subsoils. They comprise 40 percent of the association.

This association is well suited to bottomland hardwoods and cypress, having been improved since 1941 by flood reduction and water diversion from Santee River into Lakes Marion and Moultrie.

This association, because of flooding hazard and soil conditions, is unsuited or very severely limited for residences, industry and transportation uses. Agricultural uses are likewise limited. Switch cane grows in abundance and is grazed by cattle and deer. Areas, if adequately drained and protected from flooding, can be expected to respond well to good management.

This association, although not well suited for developed recreation, is well suited in its natural condition for ducks, deer and wild turkey. The streams and lakes in the area afford excellent fishing, and nationally known camps are in the vicinity of these.

Soil Association 2 (Map Symbol 2)

Swamp association: Nearly level, very poorly drained, flooded bottomlands.

This association consists of long, narrow, level, flooded areas bordering Cypress Creek and in Four Hole Swamp. It is about 3 percent of the county area.

The surface layer of swamp soils ranges from sand to clay loam and is dark gray to black. Loam and organic surface layers are in some of the backwater and depressed areas. Subsoils are gray and range from sand to clay. Sandy clay is prevalent.

This association is suited to swamp hardwoods and cypress. Use for this kind of forest is expected to continue. Flooding very severely limits or prevents this association from being used for agriculture, residences, industry, road sites and developed recreation. It is well suited for the production of duck, deer, and wild turkey, especially where provision is made for food. Fishing is good in the streams. This association is a part of many organized hunting club areas leased by landowners as a source of income.

Soil Association 3 (Map Symbol 3)

Coxville-Portsmouth association: Nearly level, poorly to very poorly drained soils with clay to sandy clay loam subsoils.

This association is a broad, nearly level area with numerous oval-shaped depressed bays. The bays are 1 to 2 feet lower than the plain and have a northwest-southeast orientation. The association is about 11 percent of the county and includes Pigeon Bay, Ferguson Bay, Mosquito Bay and Catons Bay.

Coxville soils comprise about 50 percent of the association and are in the broad level flats. They are poorly drained and have a dark gray surface layer and a gray sandy clay subsoil. Portsmouth soils are 40 percent of the association and are in the drainways and the more depressed parts of the bays. They are very poorly drained and have a black loam surface layer and a gray sandy clay subsoil. Minor soils comprising 10 percent of the association include Goldsboro, Lynchburg and Dunbar. Hellhole Bay and Pigeon Bay have peat and muck soils.

About 90 percent of the area is woodland and the remainder is cropland and some pasture. It varies from excellent to poor for pines and hardwoods because of high water tables and standing water. Corn, tobacco, and cotton are grown on the better drained minor soils.

Intensive drainage is required if the Coxville and Portsmouth soils are to be used for farm crops.

The association has severe limitations for residences using septic tanks, commercial and transportation use. Some agricultural uses are limited, due to inadequate outlets for drainage. Foods for quail and deer are plentiful. Landowners either hunt and/or lease hunting rights as a source of income.

Soil Association 4 (Map Symbol 4)

Goldsboro-Norfolk-Portsmouth association: Nearly level to depressed, moderately well drained, well drained, and very poorly drained soils. This association is a nearly level plain with numerous small, oval and elongated, narrow wet depressions or bays oriented in a general north-south direction.

This association is in the northwest part of the county and is 3 percent of the county.

Goldsboro soils are 60 percent of the association and are on the broader, nearly level areas. They are moderately well drained and have a dark grayish-brown loamy sand surface layer and a slightly mottled sandy loam to sandy clay loam subsoil. The Norfolk soils comprise 15 percent of the association and are on higher narrow areas. They are well drained and have a gray-brown loamy sand surface layer and a yellowish-brown sandy loam to sandy clay loam subsoil. The Portsmouth soils are 15 percent of the association and are in the depressions. They are very poorly drained and have black loam surface layers and gray clay loam subsoils. Lynchburg, a somewhat poorly drained soil, and Lakeland, a dry sandy soil, are minor soils making up the remainder of the association.

About 65 percent of the association is in cultivation and 30 percent in pine and pine-hardwood forests. The remainder is improved pasture. It varies from poor to excellent for the production of pine and commercial hardwoods.

Most of the grazing is in idle fields, and cultivated fields after harvest, and in woodlands. The average farm is about 35 acres in size and is owner-operated. The main income is from cotton, corn, and some tobacco.

The association is suitable for farming. It has moderate limitation for residences requiring septic tanks, road sites, and industrial sites. The wetter areas have severe limitations for these uses. Fishing and quail hunting under good management can be maintained at a high level. The area has much good cover and there are many natural and cultivated plants that are productive as quail foods. Hunting-right leases are good sources of income, as are cabins and cabin sites for rent for fishermen.

Soil Association 5 (Map Symbol 5)

Eulonia-Weston-Edisto association: Nearly level, moderately well drained to somewhat poorly drained soils with sandy clay loam to clay subsoils.

This association is a broad, nearly level area with a random drainage pattern leading to tidal marshes. Most of it is less than 15 feet above sea level and ranges from 5 to 25 feet.

The association is about 2 percent of the county and is in the Goose Creek Reservoir and Daniels Island part of the county.

Eulonia soils are about 35 percent of the association and are on the highest areas. They are moderately well drained and have a dark grayish-brown loamy sand surface soil and a yellowish-brown sandy clay subsoil. Weston soils are about 30 percent and are in low positions along the intermittent drainageways. Edisto soils are about 20 percent of the association and are intermediate in elevation between the Eulonia and Weston soils. They are somewhat poorly drained and have a dark grayish-brown sandy loam surface layer and a yellowish-brown sandy loam subsoil. The Bladen, Fairhope and Wando soils are minor and are about 15 percent of the association. Bladen is poorly drained and is in the lowest areas bordering streams and tidal marshes. Fairhope soils are well drained, gently sloping soils. They have red compact sandy clay subsoils. Wando is a deep droughty sand.

About 40 percent of the association is woodland, 20 percent pasture, 10 percent cropland and 30 percent in urban and industrial use. The areas is excellent for production of pine and hardwoods. Areas that can be drained adequately are being developed for housing and commercial sites. Streams in the area are excellent for fishing and water skiing. Sections of this association are used for hunting deer and quail. Wildlife food is plentiful.

Soil Association 6 (Map Symbol 6)

Bladen-Weston-Eulonia association: Level to nearly level, poorly drained to moderately well drained loam to loamy sand soils with clay to sandy clay loam subsoils.

This association is a long, narrow, nearly level plain crossed by numerous shallow drainageways. Flooding is frequent for about half its length where it borders Wadboo Creek and West Branch Cooper River. The southern half is not flooded because it is higher and farther from the river. The association is about 2 percent of the county.

Bladen soils occupy 60 percent of the association and are on a level floodplain bordering the creek and river. They are poorly drained and have very dark gray sandy loam to loam surface layers and mottled gray fine sandy clay or clay subsoils. The Weston soils are 25 percent of the association and are on the nearly level, slightly higher parts seldom flooded by the river. They are somewhat poorly to poorly drained soils with very dark gray loamy sand surface layers and mottled sandy clay loam to sandy clay subsoils. Eulonia soils are 10 percent of the association and are on the highest areas, well above flood stage. The remainder of the association includes the Edisto and Fairhope soils on the higher areas and Bayboro on the floodplain.

Over 90 percent of the association is suited to hardwoods, including scattered areas of pine-hardwoods on the higher unflooded part. The remaining 10 percent is mostly residential and built-up areas. The association will probably remain in woodland, with an increase in residential and industrial development on the higher areas.

That part of the association subject to flooding (about 50 percent) is unsuited for uses other than forest, and much of the remainder has severe limitations for agriculture, residences requiring septic tanks and industrial uses. Severe limitations exist on the areas above flooding levels. Many plantations border this association and recreational facilities are being developed on them. The area furnishes good quail and deer hunting. Woodland duck ponds can be made by diking along small streams. Nearby streams furnish excellent fishing.

Soil Association 7 (Map Symbol 7)

Norfolk-Lynchburg-Coxville association: Well drained to poorly drained loamy sand soils with sandy clay loam to clay subsoils on narrow, nearly level ridges and flats.

This association consists of narrow nearly level parallel ridges and narrow to broad level flats and narrow drainageways. The ridges are 500 to 1,000 feet wide and 3 to 6 feet above the flats and drainageways. There are a few short steep slopes along the larger creeks. The flats are 1,000 to 2,500 feet wide. The association is 24 percent of the county area.

The Norfolk soils are 35 percent of the association and are on the ridges. They are well drained and have a grayish-brown loamy sand surface layer and a yellowish-brown sandy clay loam subsoil. The Lynchburg soils are 30 percent of the association and are on the lower side of the ridges and nearly level parts of the flats. They are somewhat poorly drained and have a dark gray to black loamy sand surface layer and a mottled light brownish-gray to light gray sandy loam subsoil. Coxville soils are 25 percent of the association and are on the flats and bays. They are poorly drained and

have a very dark gray to black sandy loam surface layer and a mottled gray sandy clay subsoil. The remainder of the association consists of Goldsboro, Klej and Lakeland on the intermediate and higher parts and Portsmouth in the drainageways.

About 30 percent is in cultivation, 5 percent in pasture, and the remainder in pine and pine-hardwood forests to which it is moderately to well suited. The trend is towards more pasture and woodland. The average farm is about 60 acres in size. Most farms are owner-operated. Main income is from cotton, tobacco, and soybeans, with secondary income from hogs.

In the western part of the county, cotton, corn, and soybeans are the important crops. In the northern part, cotton, tobacco, soybeans, and corn are the chief crops. In that part east and south of Lake Moultrie, corn is the main crop.

This association has slight limitations on the better drained soils to severe on the wetter soils, for agriculture, woodland, residence, industrial and transportation uses. Recreation benefits are attractive for fish and wildlife revenue. Lake Moultrie and the many natural ponds afford good fishing and there are many natural draws that can be diked for fish ponds. There are good cover and food resources for quail, deer and turkey. Duck hunting is good.

Soil Association 8 (Map Symbol 8)

Tidal Marsh: Wet peats, mucks, and loams flooded by tide water.

This is a treeless plain intricately dissected by meandering drainageways and flooded daily by tidewater. Most of the association is at about mean sea level but ranges from 5 feet above to 5 feet below sea level. It is about 3 percent of the county and borders the Wando River and lower reaches of the Cooper River.

Most of the tidal marsh is soft clay having a black oozy clay surface layer underlain by gray soft clays. It has a thick, tall growth of salt-tolerant grasses. This is called Tidal marsh, soft. Small areas of firmer marsh (Tidal marsh, firm) occur where tide water does not cover the marsh as deep or as long as on soft marsh. It has a dark gray surface layer and a gray clay, sand, or sand-clay subsoil. The marsh vegetation is 6 to 24 inches tall and less thick than the soft-marsh grasses.

The salt content of the water prevents the growth of vegetation except the salt-tolerant grasses. If drained, the soil develops into an extremely acid plastic clay commonly called "cat clay". All vegetation is killed and the soil is difficult to reclaim.

Flooding, poor internal drainage, potential for becoming extremely acid, and low bearing capacity are limitations that give tidal marshes very severe limitations for residences, industrial and transportational use, and agriculture. These marshes furnish some facilities for fishing and crabbing. They may be managed as duck ponds if water control systems, including dikes, are constructed. Widgeon grass, as food for ducks, grows well where the water is brackish.

Soil Association 9 (Map Symbol 9)

Fresh Water Marsh: Very poorly drained, clayey soils flooded by fresh water.

This is a level, treeless flooded plain bordering the east and west branches of the Cooper River. Elevations range from 5 to 8 feet above sea level. The association is about 2 percent of the county.

The soils are unclassified. The surface layer is dark gray to black soft clay underlain by gray firm clay. Reeds, rushes, cattails, and fresh water marsh grasses grow in the shallow water areas.

Flooding prevents its use for residential, industrial, transportational, and agricultural use. At one time this association was used extensively for rice. The old rice lands are well suited for development of fish and duck ponds.

Soil Association 10 (Map Symbol 10)

Plummer-Rutlege association: Poorly drained and very poorly drained wet sands in depressions and low, nearly level flats.

This association is a broad wooded plain with numerous small to large oval shallow depressions (Carolina Bays) with a northwest to southeast axis. The larger ovals have a low narrow sand rim on the southeast side. The small ovals range from a few hundred feet to 2,500 feet in length. Large ovals are a mile to 2 miles long. The small ones are more numerous. This association occupies about 1 percent of the county.

Plummer soils are 50 percent of the association and are on the slightly higher, nearly level areas along the inside edge of the bays. They have thin black sand surface layers and loose light gray sand subsoils. Rutlege soils are 40 percent of the association and are in the permanently wet, depressed, central parts of the bays and along the drainageways. They have black loamy sand to loam surface layers about 8 to 12 inches thick underlain by light gray loose sand. The remainder of the association consists of Klej and Lakeland soils on the rims and shallow organic soils in the deeper depressions.

The association, because of extreme wetness, is suited for pond pine, cypress, and bottomland hardwoods. Areas with water management are producing loblolly and slash pine. The association is unsuited for residence, industry, or agricultural use. Drainage improves the suitability for crops and pasture.

This association is quite productive of wildlife. The wet areas produce some food for wildlife and give excellent cover. Practically all of the acreage is leased for hunting rights for deer, duck, and other wildlife.

Soil Association 11 (Map Symbol 11)

Craven-Duplin-Dunbar-Coxville association: Moderately well drained to poorly drained slightly undulating to level soils with sandy clay loam to sandy clay subsoils.

This association is dominantly upland flats with ill-defined sand on drainageways. It

occupies 40 percent of the county and comprises much of the eastern half of the county.

Craven soils are 20 percent of the association and are on the highest areas. They are moderately well drained and have dark gray fine sandy loam surface layers and yellowish-brown clay subsoils. Duplin soils are 18 percent of the association and are on the highest areas. They are moderately well drained and have dark gray fine sandy loam surface layers and yellowish-brown to pale brown clay subsoils. Dunbar soils are 35 percent of the association and are on the nearly level parts adjacent to the Duplin soils. They are somewhat poorly drained and have very dark gray fine sandy loam surface layers and clay subsoils. Coxville soils are 20 percent of the association and are in the drainageways and flats. They are poorly drained and have very dark gray to black fine sandy loam surface layers and gray clay subsoils. The remainder of the association consists of Caroline soils on the slopes. Bayboro and Portsmouth in the depressions and Goldsboro on somewhat sandy ridges. Deep sand soils, Lakeland and Klej occur in the Honey Hill section.

About 15 percent of the association is cropland and pasture - the remainder is woodland. The area is well to poorly suited to pine and/or hardwoods. About half of the association is in the Francis Marion National Forest. The use trend is toward more pasture and woodland. The average agricultural farm is 75 acres in size and is owner-operated. Plantations managed as tree farms border the Cooper River and its branches and range from 1,000 to 3,000 acres. A few woodland company tracts exceed 3,000 acres.

The main farm income is from cotton, some tobacco, soybeans, corn and livestock.

The association is fair for farming and the soils respond well to drainage. They have moderate to severe limitations for industrial use and for residences that require septic tanks.

Under good management, this association is productive of good plants for quail, deer, and turkey. Field crops, bicolor lespedeza, and other plants are among the more productive food plants. Landowners either hunt and/or lease hunting rights as a source of income.

Soil Association 12 (Map Symbol 12)

Leaf-Wahee-Flint association: Poorly drained to moderately well drained soils on nearly level to gently undulating stream terraces.

This association is a nearly level, long, narrow band along the west side of the Santee River and is flooded less frequently than river bottoms. The association is 4 percent of the county area.

The Leaf soils, making up 45 perent of the association, are on the level to depressed areas and along drainageways. They are poorly drained and have black fine sandy loam surface layers and gray mottled clay subsoils. Wahee soils are 35 perent of this association and are on the nearly level areas slightly higher in elevation than Leaf soils. They have dark gray to gray fine sandy loam surface layers and mottled light gray, yellow and reddish-yellow silty clay subsoils. Flint soils are 20 percent of the association and are the nearly level highest areas, knolls and gentle slopes. They are moderately well drained and have gray to dark brown shallow fine sandy loam surface layers and yellowish-red clay subsoils.

About 3 percent of the association is in crops and pasture. The remainder is in woodland. About 85 percent is privately owned and the remainder of the association is in Francis Marion National Forest. General farm crops and pasture grasses are grown on the open land. The association is only fair for farming because of wetness. It has moderate to severe limitations for building sites and industrial purposes. It has severe limitations for residences requiring septic disposal systems.

This association is well suited for pine and hardwoods and recreational uses. The banks next to the river on the higher elevations make ideal cabin sites. The adjoining river offers good fishing. The draws are good sites for duck and fish ponds. Deer and turkey foods are plentiful. Hunting is excellent.

Factors Considered in Preparation of Plan

The Drainage Feasibility Study was prepared by engineers of the Soil Conservation Service with the assistance of the Berkeley County Supervisor's Office and U. S. Forest Service. On-site investigations were made of the outlets for each main canal, and the factors affecting drainage within the watershed, such as tidal ranges, river stages, flooding, and the time of year in which flooding occurs, were studied.

The soil association description of the county, prepared by Soil Scientists of the Soil Conservation Service, was used to determine the soil characteristics which affect drainage design and construction. Present land use and anticipated future land use was considered in preparing the design of drainage canals. Engineering information available through the Berkeley Work Unit Office of the Soil Conservation Service was also used, particularly that pertaining to drainage investigations.

U. S. Geological Survey Topographic Maps were used to determine the general topography within each watershed and to assist in delineation of watersheds. A limited amount of instrument surveying was made to secure detailed information in critical areas.

Aerial photographs, scale 1" = 1320', flown in 1957-58, were used in recording field data and for the preparation of the drainage plan.

Agencies and commercial concerns, having knowledge of specific drainage problems, were consulted in making the final decisions in certain areas. Also, maps, surveys, and plans available from these agencies were used.

In most instances, mains were located along natural drainageways with modifications in alignment to improve the flow and the collection of water. All needed laterals within the watersheds were not located since the purpose of the study is to locate and design only the main canals which will furnish the means for disposal of runoff from all parts of the watershed. All

mains are terminated in tidal creeks or natural outlets at a point where they have adequate capacity and depth.

No attempt was made to locate underground utilities such as cables, gas pipe lines, water mains, and conduits. However, due consideration must be given to the location of these underground utilities during the preparation of the final plans.

In general, the drainage plan was limited to areas considered as "high lands", that is, five feet or more above mean low water.

Drainage plans were not prepared for areas in the southern part of the county owned by the U. S. Navy. These lands, including the Naval Ammunition Depot and the Polaris Missile Base, were omitted due to the fact that it is their policy to handle their own drainage problems.

Watersheds draining into the county from adjoining counties were determined for the purpose of designing main canals. The mains, however, are shown beginning at the county line. Due attention was given to possible land use changes which would affect runoff within the portion of these watersheds in adjacent counties.

Engineering Considerations

Engineering considerations for planning, design, construction, maintenance and other matters pertinent to the Main Drainage Canals Feasibility Study are listed below:

Design

1. The plan presented herewith is a Feasibility Study to estimate the cost and the extent of needed main drainage facilities and the physical practicability of drainage in the county. Detailed engineering surveys and designs will be required before any part of the proposed plan is constructed. All improvements should be made continuous, beginning at the lower or outlet end of the watershed.

2. Plans and designs contained in this report do not include a complete study of underground storm sewers found in Areas 1, 2, and 6, due to the fact that these are not considered as mains. Also, there is a lack of information on original surveys and designs showing size, depth, and location. Detailed studies will be needed to determine the present condition of these storm sewers and their additional needs.

3. Culverts at rail and road crossings were designed to satisfy the minimum requirements based on expected flow. Increases in size of these structures may be desirable to provide an added safety factor for passing runoff in excess of designed flow; especially, where presently unforeseen improvements are made in the vicinity.

4. The South Carolina Wildlife Resources Department should be consulted when fish and wildlife may be affected by the construction of main drainage canals.

Acquisitions of Rights-of-way

The means for, and the acquisition of, adequate rights-of-way for the installation of main canals is absolutely essential. The width of the right-of-way must be adequate to take care of spoil management, channel cross sections, berm, and access. (See Figure 2)

Maintenance of Channels

A well organized and adequately financed maintenance program is essential to maintain design capacity in all canals. Provision for annual maintenance or periodic reconstruction to maintain the effectiveness of the channel must be considered prior to construction. The failure of many drainage enterprises to function as designed can be directly attributed to an inadequate maintenance program. Maintenance of the designed depth of channels is one of the most important items in a maintenance program. The cost of maintenance may be reduced considerably if provision is made in channel designs for easy access, stabilization of side slopes and other silt-contributing areas such as road fills and road drainage immediately following construction. Provision should also be made for maintenance of pumps, conduits, tide gates and dikes, so that these installations may be completely operable at all times.

Obstructions

Construction of fences, walks, and other structures that may retard channel flow should not be permitted except as approved by the responsible agency of the County Government. Other structures such as culverts, bridge piers, trestles, etc., should be designed so as to cause minimum interference with the channel flow. Dumping trash, garbage, and other debris in channels should be prohibited.

Definition of Terms

c.f.s. - Abbreviation for cubic feet per second; a unit of water-flow - sometimes call "second feet".

Infiltration - The entrance of water into surface horizons or sola.

Internal Drainage - The movement of water through the soil profile. The rate is affected by the texture of the surface soil and of the subsoil and by the height of the water table. A wet, deep sand may have slow internal drainage when the water table is high, and rapid internal drainage when the water table is low. A plastic, sandy clay soil may have slow internal drainage regardless of water table height.

Lateral Ditch - A major ditch in a drainage system which serves as a link between the main ditch and the collection system in a segment of the watershed.

Main Canal (Ditch or Channel) - The principal channel which conducts the drainage water from the watershed to the outlet.

Permeability Rate - The rate of movement of water through the soil

Profile, Soil - A vertical section of the soil through all its horizons and extending into the parent material.

Reach - A length of channel selected for use in hydraulic computations.

Relief - The elevations or inequalities of a land surface, considered collectively.

Runoff, Surface - Total rainfall minus interception, infiltration, and surface storage, that which moves across the ground to a stream or depression.

Runoff, Subsurface - Water that infiltrates the soil and reappears as seepage or spring flow.

Soil Drainage - (1) The rapidity and extent of the removal of water from the soil by runoff and flow through the soil to underground spaces. (2) As a condition of the soil, the frequency and duration of periods when the soil is free of saturation. For example, in well-drained soils, the water is removed readily, but not rapidly; in poorly drained, the root zone is waterlogged for long periods and the roots of ordinary crop plants cannot get enough oxygen; and in excessively drained soils, the water is removed so completely that most crop plants are damaged by lack of water.

Soil Structure - The arrangement of the individual grains and aggregates that make up the soil mass; may refer to the natural arrangement of the soil when in place and undisturbed or to the soil at any degree of distrubance.

Subsoil - In soils with weak profile development, the subsoil can be defined as the soil below the plowed soil (or its equivalent of surface soil) in which roots normally grow.

Surface Soil - The soil ordinarily moved in tillage or the equivalent in uncultivated soil about 6 to 10 inches in thickness.

Terrace (Geological) - An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, Soil - The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportions of fine particles are as follows: sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse", "fine", or "very fine". A coarse textured soil is one high in sand content; a fine textured soil is one high in clay content.

Tide Data

Mean Range - Difference between mean high water and mean low water.

Spring Range - The average range which occurs semi-monthly as a result of the moon's being full or new.

Mean Tide Level - (Half tide level) - is a plane midway between mean low water and mean high water.

High Water - The maximum height reached by each rising tide.

Water-holding Capacity - The ability of a soil to hold water. The capacity (or ability) of soil to hold water against gravity.

Watershed - An area of land from which all water that falls within the area, converges toward and discharges past a designated point.

TABLE NO. 2
SUMMARY OF DATA AND ESTIMATED COST
DIKES - TIDE GATES AND PUMPS

Area No.	Pump Site No.	Main Canal No.	Dike Length - Ft.	Pumps		Estimated Total Cost
				No.	Capacity - Ea. - GPM	
1	A	M-18	700	3	50,000	$ 65,000.00
GRAND TOTAL						$ 65,000.00

TABLE NO. 3
SUMMARY OF ENGINEERING AND DESIGN DATA BY AREAS

Area Number	Length Canals and Laterals Feet	Excavation Cubic Yards	Right-of-Way Clearing Acres	Dike and Pump Installations Number	Estimated Total Cost Dollars
1	581,100	1,301,578	562.4	1	433,218.00
2	258,300	480,695	222.8	-	179,513.00
3	794,000	1,962,278	850.9	-	652,137.00
4	284,900	464,017	222.7	-	163,528.00
5	295,000	478,126	229.2	-	181,713.00
6	413,000	715,303	339.6	-	271,697.00
7	432,800	936,793	417.3	-	308,554.00
8	543,300	1,424,379	605.7	-	469,186.00
9	460,900	1,080,339	471.4	-	337,988.00
10	426,800	657,997	321.1	-	228,523.00
11	573,400	1,655,244	690.2	-	515,188.00
12	887,800	1,536,681	726.8	-	514,313.00
13	545,200	934,663	435.3	-	314,504.00
COUNTY TOTALS	6,496,500	13,628,093	6,095.4	1	4,570,062.00

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U. S. Department of Agriculture, Soil Conservation Service - NATIONAL ENGINEERING HANDBOOK - HYDROLOGY - Section 4.

Feasibility Study for Main Drainage Canal in Charleston County.

Authority and Acknowledgement

Authorization for preparation of the Feasibility Study of Requirements for Main Drainage Canals for Berkeley County is the result of a cooperative agreement entered into on March 4, 1963 by:

Berkeley County - Rembert C. Dennis, State Senator
Henderson Guerry, Member of House of Representatives
H. N. West, Member of House of Representatives

Berkeley Soil Conservation District - N. L. Harvey, Chairman

Soil Conservation Service - T. S. Buie, State Conservationist

U. S. Forest Service - P. H. Russell, National Forest Supervisor

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Soil Association Map and Descriptions by:

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Others who furnished data, information, or services used in the preparation of this report are as follows:

Berkeley County Road Department	U. S. Forest Service
West Virginia Pulp and Paper Co.	U. S. Corps of Army Engineers
U. S. Weather Bureau	South Carolina Public Service Authority
South Carolina Highway Department	South Carolina Wildlife Resources Department
Fairbanks-Morse and Company	South Carolina Extension Service,Clemson, S.C

The assistance of J. Clifford Martin, Moncks Corner, S. C., in the completion of this report is gratefully acknowledged.

Cartography and Printing – Spartanburg Cartographic Unit, Soil Conservation Service

Explanation of Engineering Data Tables

The following Engineering Data Tables contain information, by areas, for each main canal and laterals, by watersheds.

An explanation of each column in the Engineering Data sheets is as follows:

Column 1 CANAL NUMBER
Numbering of main canals begins with M-1 and laterals with L-1, in each area.

Column 2 LENGTH IN FEET
The stationing of all mains and laterals begins at the upper end (headwaters) and continues toward the outlet. The mains and laterals are shown in reaches or sections in the data tables for design purposes. Each reach, or section, reflects a change in water concentration resulting from the entrance of lateral drainage.

Column 3 WATERSHED IN ACRES
See Definition of Terms

Column 4 DISCHARGE - CUBIC FEET PER SECOND
From appropriate drainage coefficient curves dependent on the land use.

Column 5 TOP WIDTH IN FEET
Self explanatory

Column 6 BOTTOM WIDTH IN FEET
Self explanatory

Column 7 AVERAGE DEPTH IN FEET
Self explanatory

Column 8 EXCAVATION IN CUBIC YARDS
Self explanatory

Column 9 RIGHT-OF-WAY CLEARING IN ACRES
Self explanatory

Column 10 REQUIRED RIGHT-OF-WAY WIDTH IN FEET
Based on minimum requirements for channel cross section, spoil management, berm width, and access road for maintenance equipment.

Column 11 CULVERTS, LOWERING - LENGTH AND SIZE
Refers to the existing in-place culverts which are to be re-used.

Column 12 CULVERTS AND BRIDGES - NEW - LENGTH AND SIZE
Refers to additional culverts or bridges required to handle design discharge. Design of culverts is based on round concrete pipe.

R.C. Br. - Reinforced Concrete Bridge
C.T. Br. - Creosoted Timber Bridge
U.T. Br. - Untreated Timber Bridge

Column 13 TOTAL ESTIMATED COST IN DOLLARS
Total costs shown include only the estimated construction costs and do not include engineering costs and the cost of acquiring required right-of-way. When preparing the final cost estimates these engineering costs and right-of-way costs should be included in the total cost of the project. Total estimated costs as shown are based on the following unit prices prevailing in Berkeley County in 1964.

EXCAVATION
Rural Area - High Ground - - $0.20 per cu. yd.
Urban Areas - - - - - - - - $0.30 per cu. yd.
Marsh - - - - - - - - - - - $0.50 per cu. yd.

DIKE EMBANKMENT MATERIAL
In Place - - - - - - - - - - $1.00 per cu. yd.

RIGHT-OF-WAY CLEARING AND GRUBBING
All Areas - - - - - - - - $200.00 per acre

LOWERING EXISTING CULVERTS
Labor and equipment costs only.

NEW CULVERT AND CONDUIT COSTS
Based on present cost of circular concrete pipe.

BRIDGES
Three types of bridges were used for design purposes.
1. Precast reinforced concrete bridges were used under main highways and secondary roads.
2. Pressure-treated creosoted timber bridges were used under National Forest roads and other county roads.
3. Untreated timber bridges were used on farm and private roads.

PREVAILING COSTS OF BRIDGES
Reinforced concrete bridges - - $100.00 per linear foot
Creosoted timber bridges - - - $ 50.00 per linear foot
Untreated timber bridges - - - $ 33.33 per linear foot

ENGINEERING AND DESIGN DATA

Area 1 - Hanahan - Goose Creek - Carnes Crossroads - Oakley

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1	3700	392	30	13	3	5	5476	2.7	38	--	--	
M-1	3500	580	41	13	3	5	5180	2.6	38	--	--	
M-1	1100	1124	72	13	3	5	1628	0.8	38	--	--	
M-1	4400	2196	127	18	8	5	10,604	4.6	52	--	--	
M-1	2200	2784	152	20	10	5	6116	2.6	57	--	--	
L-1	5000	496	47	13	3	5	7400	2.9	38	40' - 24"	--	
L-2	6400	740	51	13	3	5	9472	4.7	38	--	--	
L-3	4200	452	34	13	3	5	6216	3.1	38	--	--	
L-4	4400	240	20	13	3	5	6512	3.2	38	30' - 18"	--	
Total-1	34,900						58,604	27.2				20,306.00
M-2	3500	356	28	13	3	5	5180	2.6	38	--	--	
M-2	900	632	45	13	3	5	1332	0.7	38	--	--	
M-2	5500	868	58	13	3	5	8140	4.0	38	--	--	
M-2	2100	2234	127	16	6	5	4284	1.9	46	--	--	
M-2	7900	3366	179	18	8	5	19,039	8.3	52	--	--	
M-2	7100	5246	262	22	12	5	22,365	9.1	62	--	--	
M-2	5200	6406	310	24	14	5	18,304	7.4	68	--	--	
L-1	4500	188	16	13	3	5	6660	3.3	38	20' - 24"	--	
L-2	4700	300	24	13	3	5	6956	3.5	38	--	40' - 24"	
L-3	3100	152	13	13	3	5	4588	2.3	38	--	--	
L-3	8200	1192	75	13	3	5	12,136	6.0	38	--	--	
L-4	5900	484	36	13	3	5	8732	4.3	38	40' - 36"	--	
L-5	7000	720	48	13	3	5	10,360	5.1	38	80' - 48"	--	
L-6	7400	680	48	13	3	5	10,952	5.4	38	40' - 18" 40' - 24"		
Total-2	73,000						139,028	63.9				42,300.00
M-3	5800	912	61	13	3	5	8584	4.3	38	80' - 30"	--	
M-3	5900	1360	84	13	3	5	8732	4.3	38	--	--	
Total-3	11,700						17,316	8.6				5,591.00
M-4	5500	360	28	13	3	5	8140	4.0	38	40' - 18"	--	
M-4	3800	822	56	15	5	5	7030	3.3	44	--	15' R.C. Br.	
L-1	4200	236	19	13	3	5	6216	3.1	38	40' - 18"	--	
Total-4	13,500						21,386	10.4				8,041.00
M-5	4800	740	51	13	3	5	7104	3.5	38	--	15' R.C. Br.	
M-5	4000	960	63	14	4	5	6680	3.2	41	--	15' R.C. Br.	
Total-5	8800						13,784	6.7				7,097.00
M-6		1740	Present canal as constructed is considered adequate							--	--	
M-6		2332	Present canal as constructed is considered adequate							--	--	
M-6	4400	2460	138	19	9	5	11,396	4.9	55	--	15' R.C. Br.	
M-6	5900	5324	291	30	20	5	27,317	10.6	84	--	--	
M-6	4400	6408	310	32	22	5	22,000	8.4	89	--	--	
M-6	2800	6940	314	32	22	5	14,000	5.3	89	--	30' R.C. Br.	
M-6	12,400	9560	429	40	30	5	80,352	29.6	110	--	--	
M-6	5200	13,288	571	50	40	5	43,316	15.6	137	--	--	
M-6	4000	16,410	692	60	50	5	40,760	14.4	163	--	--	
M-6	4300	19,130	770	70	60	5	51,772	18.2	190	--	--	

ENGINEERING AND DESIGN DATA

Area 1 - Hanahan - Goose Creek - Carnes Crossroads - Oakley

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-6	2400	19,810	791	70	60	5	28,896	10.1	190	--	--	
L-1	5100	508	37	13	3	5	7548	3.7	38	--	15' R.C. Br.	
L-2		976	Present canal as constructed is considered adequate									
L-2	6300	1476	90	16	6	5	12,852	5.8	46	--	--	
L-3	7700	840	56	13	3	5	11,396	5.1	38	--	--	
L-4	4800	284	23	13	3	5	7104	3.5	38	40' - 18"	--	
L-5	3100	212	18	13	3	5	4588	2.3	38	60' - 18"	30' - 48"	
L-5	5900	980	64	14	4	5	9853	4.7	41	--	40' - 24"	
L-6	4700	288	23	13	3	5	6956	3.5	38	--	--	
L-7	8700	1268	79	15	5	5	16,095	7.6	44	--	40' - 24"	
L-7	7400	2368	133	18	8	5	17,834	7.8	52	--	15' R.C. Br.	
L-7	1700	3228	174	22	12	5	5355	2.2	62	--	--	
L-8	8100	784	54	13	3	5	11,988	6.0	38	--	--	
L-9	7200	676	68	14	4	5	12,024	5.8	41	70' - 36"	--	
L-9	6400	1596	96	16	6	5	13,056	5.9	46	--	2-15' R.C.Brs.	
L-9	3500	2666	148	20	10	5	9730	4.1	57	--	--	
L-10	3200	188	16	13	3	5	4736	2.4	38	80' - 24"	--	
L-11	7200	770	53	13	3	5	10,656	5.3	38	30' - 24"	2-15' R.C.Brs.	
L-12	7900	748	51	13	3	5	11,692	5.8	38	--	--	
L-12	2100	1180	75	15	5	5	3885	1.8	44	--	--	
L-12	1400	1592	97	16	6	5	2856	1.3	46	--	--	
L-12	2400	2472	139	20	10	5	6672	2.8	57	--	--	
L-13	3700	368	28	13	3	5	5476	2.7	38	--	--	
L-14	4600	356	28	13	3	5	6808	3.4	38	--	--	
L-15	8100	800	54	13	3	5	11,988	6.0	38	--	--	
L-16	5500	400	31	13	3	5	8140	4.0	38	--	--	
Total-6	172,500						539,097	220.6				167,889.00
M-7	7000	1060	68	14	4	5	11,690	5.6	41	--	--	
M-7	5700	1792	106	18	8	5	13,737	6.0	52	--	--	
M-7	6700	3236	174	22	12	5	21,105	8.6	62	--	--	
M-7	1500	4524	229	26	16	5	5280	2.3	73	--	--	
L-1	5600	624	44	13	3	5	8288	4.1	38	--	15' R.C. Br.	
L-2	4800	1080	70	14	4	5	8016	3.9	41	--	2-15' R.C.Brs.	
Total-7	31,300						68,116	30.5				24,223.00
M-8	8500	672	47	13	3	5	12,580	6.3	38	60' - 36"	--	
M-8	2900	1912	112	15	5	5	5365	2.5	44	--	--	
M-8	6400	2560	144	16	6	5	13,056	5.9	46	--	--	
M-8	4400	4934	242	20	10	5	12,232	5.2	57	--	--	
M-8	700	5368	264	22	12	5	2205	0.9	62	--	--	
M-8	1500	5656	274	24	14	5	5280	2.1	68	--	--	
L-1			Present canal as constructed is considered adequate									
L-1	6000	1140	73	13	3	5	8880	4.4	38	--	15' R.C. Br.	
L-2	2000	268	22	13	3	5	2960	1.5	38	--	--	
L-3	4500	200	17	13	3	5	6660	3.3	38	--	--	
L-4	3900	368	28	13	3	5	5772	2.9	38	--	--	
L-4	5600	868	58	13	3	5	8288	4.1	38	--	--	
L-4	6700	1196	75	13	3	5	9916	4.9	38	--	--	

ENGINEERING AND DESIGN DATA

Area 1 - Hanahan - Goose Creek - Carnes Crossroads - Oakley

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-5	4400	308	26	13	3	5	6512	3.2	38	--	--	
L-5	5300	1178	73	13	3	5	7844	3.9	38	--	--	
L-6	2400	240	20	13	3	5	3552	1.8	38	--	--	
L-6	1000	470	35	13	3	5	1480	0.7	38	--	15' U.P. Br.	
L-7	2700	200	17	13	3	5	3996	2.0	38	--	--	
L-8	6600	384	29	13	3	5	9768	4.8	38	--	--	
L-9	4300	184	16	13	3	5	6364	3.2	38	--	--	
Total-8	79,800						132,710	63.6				41,682.00
M-9	7600	760	52	13	3	5	11,248	5.6	38	--	15' R.C. Br.	
M-9	3600	1636	98	14	4	5	6012	2.9	41	--	--	
M-9	8000	2864	156	17	7	5	17,760	7.9	49	--	2-15' R.C.Brs.	
M-9	5500	4352	224	20	10	5	15,290	6.4	57	--	--	
L-1	6600	624	44	13	3	5	9768	4.8	38	--	60' - 60"	
L-2	5300	392	30	13	3	5	7844	3.9	38	--	--	
L-3	8500	752	52	13	3	5	12,580	6.2	38	--	30' - 60"	
Total-9	45,100						80,502	37.7				30,714.00
M-10	3300	384	59	13	3	5	4884	2.4	38	--	30' - 48" 30' - 60"	
M-10	3200	760	103	14	4	5	5344	2.6	41	--	--	
Total-10	6500						10,228	5.0				4528.00
M-11	2200	244	40	13	3	5	3256	1.6	38	--	--	
M-11	4700	492	72	13	3	5	6956	3.5	38	--	--	
M-11	2900	924	122	16	6	5	5916	2.7	46	--	--	
M-11	3600	2192	253	24	14	5	11,988	5.1	68	--	--	
M-11	3900	3820	399	32	22	5	19,500	7.4	89	--	30' R.C. Br.	
L-1	3400	136	24	13	3	5	5032	2.5	38	--	80' - 24"	
L-1	1600	304	48	13	3	5	2368	1.2	38	--	--	
L-2	4100	128	24	13	3	5	6068	3.0	38	--	30' - 24"	
L-3	5200	352	55	13	3	5	7696	3.8	38	--	--	
L-4	3600	376	57	13	3	5	5328	2.6	38	--	30' - 24"	
L-4	5900	736	101	15	5	5	10,915	5.1	44	--	40' - 60"	
L-5	7900	1420	175	19	9	5	20,461	8.9	55	--	--	
Total-11	49.000						105,484	47.4				35,743.00
M-12	3300	200	44	13	3	5	4884	2.4	38	60' - 24"	50' - 18"	
M-12	2600	408	80	13	3	5	3848	1.9	38	90' - 18"	30' - 36"	
M-12	5300	1032	177	18	8	5	12,773	5.6	52	--	--	
L-1	2600	140	32	13	3	5	3848	1.9	38	--	40' - 30"	
L-1	3000	240	51	13	3	5	4440	2.2	38	--	--	
Total-12	16,800						29,793	14.0				10,243.00
M-13	3000	192	43	13	3	5	4440	2.2	38	--	40' - 42"	
M-13	2900	352	72	13	3	5	4292	2.1	38	--	--	
Total-13	5900						8732	4.3				3278.00
M-14	4500	190	33	13	3	5	6660	3.3	38	--	30' - 36"	
Total-14	4500						6660	3.3				2412.00

ENGINEERING AND DESIGN DATA

Area 1 - Hanahan - Goose Creek - Carnes Crossroads - Oakley

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-15	4000	296	47	13	3	5	5920	2.9	38	--	--	
M-15	3400	672	93	14	4	5	5678	2.7	41	--	15' R.C. Br.	
L-1	3700	208	35	13	3	5	5476	2.7	38	--	--	
Total-15	11,100						17.074	8.3				6575.00
M-16	4700	276	44	13	3	5	6956	3.5	38	--	30' - 42"	
Total-16	4700						6956					2595.00
M-17	4900	404	61	13	3	5	7252	3.6	38	--	30' - 36"	
Total-17	4900						7252	3.6				2590.00
M-18	700	124	29	13	3	5	1036	0.5	38	--	--	
M-18	1200	150	35	13	3	5	1776	0.9	38	--	--	
M-18		162	Present canal as constructed is considered adequate									
M-18		230	Present canal as constructed is considered adequate									
M-18	4000	2190	328	45	35	5	29,600	--	--	--	--	
L-1	1200	1304	214	34	24	5	6444	2.4	94	--	--	
Total-18	7100						38.856	3.8				17,411.00
Area 1 Grand Total	581,100						1,301.578	562.4				433,218.00

ENGINEERING AND DESIGN DATA

Area 2 - Moncks Corner - Oakley

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1	3000	248	20	13	3	5	4440	2.2	38	--	--	
M-1	2500	344	27	13	3	5	3700	1.8	38	--	--	
M-1	1500	600	43	13	3	5	2220	1.1	38	--	40' - 48"	
M-1	2500	820	56	13	3	5	3700	1.8	38	--	--	
M-1	3000	1977	131	16	6	5	6120	2.8	46	--	--	
M-1	8800	3289	177	18	8	5	21,208	9.3	52	--	--	
M-1	6800	3989	231	22	12	5	21,420	8.7	62	--	30' R.C. Br.	
L-1	1700	120	11	13	3	5	2516	1.2	38	--	180' - 24"	
L-2		352	Present canal as constructed is considered adequate									
L-2	1600	409	31	13	3	5	2368	1.2	38	--	30' - 60"	
L-2	3200	521	38	13	3	5	4736	2.4	38	--	--	
L-3	3600	320	25	13	3	5	5328	2.6	38	40' - 54"	--	
L-3	2600	512	37	13	3	5	3848	1.9	38	--	--	
Total-1	40,800						81.604	37.0				30.195.00
M-2	4700	400	29	13	3	5	6956	3.5	38	--	20' - 54" 20' - 54"	
Total-2	4700						6956	3.5				3031.00
M-3	3800	288	23	13	3	5	5624	2.8	38	--	30' - 30"	
M-3	1800	408	31	13	3	5	2664	1.3	38	--	--	
M-3	900	812	55	13	3	5	1332	0.7	38	--	--	
M-3	6200	1332	83	13	3	5	9176	4.6	38	--	--	
M-3	2500	2796	154	16	6	5	5100	2.3	46	--	--	
M-3	2600	3456	184	18	8	5	6266	2.7	52	--	--	
M-3	7400	4932	221	20	10	5	20,572	8.7	57	--	30' R.C. Br.	
L-1	3900	120	11	13	3	5	5772	2.9	38	--	40' - 36"	
L-1	3800	224	19	13	3	5	5624	2.8	38	--	--	
L-2	2800	144	13	13	3	5	4144	2.1	38	--	--	
L-3	4300	376	28	13	3	5	6364	3.2	38	--	30' - 54" 40' - 36"	
L-3	4800	708	48	13	3	5	7104	3.5	38	--	--	
L-3	4000	1236	78	13	3	5	5920	2.9	38	--	15' R.C. Br.	
L-4	3000	280	22	13	3	5	4440	2.2	38	--	--	
L-5	4000	240	20	13	3	5	5920	2.9	38	--	--	
L-5	3000	488	36	13	3	5	4440	2.2	38	--	30' - 60"	
L-6	1700	420	31	13	3	5	2516	1.2	38	--	--	
L-6	6000	996	66	13	3	5	8880	4.4	38	--	15' R.C. Br.	
Total-3	66,500						111,858	53.4				42.041.00
M-4	1600	56	15	13	3	5	2368	1.2	38	40' - 24"	100' - 24"	
M-4	1300	116	28	13	3	5	1924	1.0	38	--	--	
M-4	2900	256	54	13	3	5	4292	2.1	38	--	--	
M-4	500	572	107	15	5	5	925	0.4	44	--	--	
M-4	1800	662	118	15	5	5	3330	1.6	44	--	2-15' R.C.Brs.	
M-4	5000	1200	211	20	10	5	13,900	5.9	57	--	--	
L-1	1900	60	15	13	3	5	2812	1.4	38	--	--	
L-1	700	116	28	13	3	5	1036	0.5	38	--	--	
L-1	1800	306	64	13	3	5	2664	1.3	38	--	--	
L-2	2100	56	15	13	3	5	3108	1.5	38	--	60' - 18"	
L-3	3600	110	27	13	3	5	5328	2.6	38	--	60' - 36"	
Total-4	23,200						41,687	19.5				17.229.00

ENGINEERING AND DESIGN DATA

Area 2 - Moncks Corner - Oakley

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-5	800	16	7	13	3	5	1184	0.6	38	60' - 18"	--	
										60' - 24"		
M-5	2000	104	26	13	3	5	2960	1.5	38	--	30' - 36"	
M-5	3800	444	86	13	3	5	5624	2.8	38	--	40' - 42"	
											60' - 36"	
M-5	4900	756	136	16	6	5	9996	4.5	46	--	15' R.C. Br.	
L-1	3000	120	29	13	3	5	4440	2.2	38	20' - 15"	--	
Total-5	14,500						24,204	11.6				10,986.00
M-6	3100	240	52	13	3	5	4588	2.3	38	--	--	
M-6	3500	360	73	13	3	5	5180	2.6	38	--	60' - 54"	
Total-6	6600						9768	4.9				4344.00
M-7	2000	88	23	13	3	5	2960	1.5	38	--	40' - 24"	
M-7	3300	268	57	13	3	5	4884	2.4	38	--	--	
M-7	3000	376	76	13	3	5	4440	2.2	38	--	15' U.T. Br.	
Total-7	8300						12,284	6.1				4469.00
M-8	6000	512	38	13	3	5	8880	4.4	38	--	40' - 54"	
M-8	3800	768	138	16	6	5	7752	3.5	46	--	15' U.T. Br.	
M-8	3400	1048	179	18	8	5	8194	3.6	52	--	15' R.C. Br.	
M-8	1500	1248	205	19	9	5	3885	1.7	55	--	2-15' R.C. Brs.	
M-8	1000	1352	219	20	10	5	2780	1.2	57	--	--	
M-8	1000	1412	228	20	10	5	2780	1.2	57	--	--	
M-8	1000	1480	236	22	12	5	3150	1.3	62	--	--	
M-8	3200	2136	321	26	16	5	12,488	4.9	73	--	--	
M-8	3200	2228	334	26	16	5	12,488	4.9	73	--	--	
M-8	2400	2408	365	28	18	5	10,224	4.0	78	--	--	
M-8	3700	3008	432	30	20	5	17,131	6.6	84	--	--	
L-1	4500	128	31	13	3	5	6660	3.3	38	80' - 24"	--	
L-2	3600	240	52	13	3	5	5328	2.6	38	80' - 36"		
L-2	2200	368	75	13	3	5	3256	1.6	38	80' - 36"		
L-3	3900	294	62	13	3	5	5772	2.9	38	--	30' - 48"	
L-3	1500	360	73	13	3	5	2220	1.1	38	--	--	
Total-8	45,900						112,988	48.8				40,334.00
M-9	4700	120	22	13	3	5	6956	3.5	38	--	--	
M-9	2500	180	31	13	3	5	3700	1.8	38	--	--	
M-9	700	460	68	13	3	5	1036	0.5	38	--	40' - 48"	
M-9	3600	676	94	14	4	5	6012	2.9	41	--	--	
M-9	2900	1268	158	17	7	5	6438	2.9	49	--	--	
M-9	5200	1684	203	19	9	5	13,468	5.8	55	--	--	
L-1	5900	260	43	13	3	5	8732	4.3	38	--	--	
L-2	1700	48	11	13	3	5	2516	1.2	38	--	40' - 18"	
L-2	1800	128	23	13	3	5	2664	1.3	38	--	--	
L-2	4400	380	61	13	3	5	6512	3.2	38	--	30' - 48"	
L-3	2400	52	11	13	3	5	3552	1.8	38	40' - 24"	--	
L-4	2600	88	17	13	3	5	3848	1.9	38	--	30' - 24"	
Total-9	38,400						65,434	31.1				21,312.00

ENGINEERING AND DESIGN DATA

Area 2 - Moncks Corner - Oakley

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-10	4000	252	20	13	3	5	5920	2.9	38	--	--	
M-10	3100	472	35	13	3	5	4588	2.3	38	--	60' - 54"	
M-10	2300	660	46	13	3	5	3404	1.7	38	--	--	
Total-10	9400						13,912	6.9				5572.00
Area 2 Grand Total	258,300						480,695	222.8				179,513.00

ENGINEERING AND DESIGN DATA

Area 3 - Wassamassaw - Cooper's Store - New Hope - Lebanon

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1	5900	832	56	13	3	5	8732	4.3	38	--	15' R.C. Br.	
M-1	3500	1208	77	15	5	5	6475	3.1	44	--	--	
M-1	8200	2484	140	19	9	5	21,238	9.2	55	--	--	
M-1	3300	3996	206	24	14	5	11,616	4.7	68	--	30' R.C. Br.	
M-1	8000	4884	244	26	16	5	31,120	12.3	73	--	30' C.T. Br.	
M-1	3000	5228	257	28	18	5	12,780	5.0	78	--	--	
M-1	1000	18,838	171	32	24	4	4150	1.7	82	--	15' C.T. Br.	
M-1	2300	19,984	178	32	24	4	9545	4.0	82	--	15' C.T. Br.	
M-1	3600	20,294	181	34	26	4	15,984	6.7	87	--	--	
M-1	4800	23,154	203	36	28	4	22,752	9.4	91	--	--	
M-1	2500	36,084	293	48	40	4	16,300	6.5	119	--	--	
M-1	2200	37,432	304	53	45	4	15,972	6.3	130	--	--	
M-1	5100	46,832	366	58	50	4	55,743	18.4	163	--	--	
M-1	4400	53,156	407	68	60	4	41,712	16.1	165	--	--	
M-1	2700	55,248	414	68	60	4	25,596	9.9	165	--	--	
M-1	1900	56,760	426	68	60	4	18,012	6.9	165	--	--	
L-1	6700	316	25	13	3	5	9916	4.9	38	--	40' - 42"	
L-2		708	Present canal as constructed is considered adequate							--	--	
L-2		1132	Present canal as constructed is considered adequate							--	--	
L-3		328	Present canal as constructed is considered adequate							--	--	
L-4	2700	984	65	14	4	5	4509	2.2	41	--	50' - 48" 15' R.C. Br.	
L-4	5000	2164	125	18	8	5	12,050	5.3	52	--	--	
L-4	4100	2800	155	20	10	5	11,398	4.8	57	--	15' R.C. Br.	
L-4	1400	2832	155	20	10	5	3892	1.6	57	--	--	
L-4	1000	4512	229	26	16	5	3890	1.5	73	--	30' C.T. Br.	
L-4	5300	5044	252	28	18	5	22,578	8.8	78	--	30' C.T. Br.	
L-4	2500	5476	270	28	18	5	10,650	4.1	78	--	30' C.T. Br.	
L-4	1800	5940	288	30	20	5	8334	3.2	84	--	--	
L-4	3900	7724	356	34	24	5	20,943	7.9	94	--	--	
L-4	5200	8180	371	36	26	5	29,848	11.1	99	--	--	
L-4	2400	9180	416	38	28	5	14,664	5.5	105	--	--	
L-4	4400	13,570	583	50	40	5	36,652	13.2	137	--	--	
L-5	6900	840	56	13	3	5	10,212	5.1	38	--	15' C.T. Br.	
L-5	6400	1456	90	16	6	5	13,056	5.9	46	--	--	
L-6		1440	Present canal as constructed is considered adequate							--	--	
L-6		1552	Present canal as constructed is considered adequate							--	15' C.T. Br.	
L-7	3600	620	44	13	3	5	5328	2.6	38	--	15' C.T. Br. 15' C.T. Br.	
L-7	5500	920	60	13	3	5	8140	4.0	38	--	--	
L-8		168	Present canal as constructed is considered adequate							--	--	
L-8		448	Present canal as constructed is considered adequate							--	24' - 48"	
L-8		1088	Present canal as constructed is considered adequate							--	--	
L-8		2970	Present canal as constructed is considered adequate							--	--	
L-8	4700	4134	213	24	14	5	16,544	6.7	68	--	--	
L-9		872	Present canal as constructed is considered adequate							--	--	
L-9		1802	Present canal as constructed is considered adequate							--	--	
L-9		1852	Present canal as constructed is considered adequate							--	--	

ENGINEERING AND DESIGN DATA

Area 3 - Wassamassaw - Cooper's Store - New Hope - Lebanon

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-10		880	Present canal as constructed is considered adequate							--	--	
L-11		736	Present canal as constructed is considered adequate							--	--	
L-12	6000	896	60	13	3	5	8880	4.4	38	--	15' C.T. Br.	
L-13	9500	980	64	14	4	5	15,865	7.6	41	--	--	
L-13	1300	1228	78	15	5	5	2405	1.1	44	--	--	
L-13	9400	2268	129	18	8	5	22,654	9.9	52	--	15' C.T. Br.	
L-13	2400	2512	141	19	9	5	6216	2.7	55	--	--	
L-14	4800	1216	77	15	5	5	8880	4.2	44	--	--	
L-14	3500	1816	108	16	6	5	7140	3.2	46	--	--	
L-14	3000	4672	234	26	16	5	11,670	4.6	73	--	--	
L-14	10,400	5892	286	30	20	5	48,152	18.6	84	--	20' C.T. Br. 20' C.T. Br.	
L-14	3900	8384	340	34	24	5	20,943	7.9	94	--	--	
L-14	1900	8560	392	36	26	5	10,906	4.1	99	--	--	
L-14	2700	8760	397	38	28	5	16,497	6.1	105	--	--	
L-14	1400	11,642	509	45	35	5	10,360	3.8	124	--	--	
L-14	700	11,982	515	45	35	5	5180	1.9	124	--	--	
L-14	3800	12,658	544	50	40	5	31,654	11.4	137	--	--	
L-14	1900	12,778	549	50	40	5	15,827	5.7	137	--	--	
L-15	6500	1600	98	16	6	5	13,260	6.0	46	--	--	
L-15	6000	2608	145	19	9	5	15,540	6.7	55	--	--	
L-16	1900	252	20	13	3	5	2812	1.4	38	--	30' - 48"	
L-16	7000	1224	77	15	5	5	12,950	6.1	44	--	--	
L-16	6000	1848	110	17	7	5	13,320	5.9	49	--	20' C.T. Br.	
L-16	2000	2056	119	17	7	5	4440	2.0	49	--	--	
L-17	6400	656	46	13	3	5	9472	4.7	38	--	30' - 54"	
L-17	4400	1836	109	17	7	5	9768	4.3	49	--	--	
L-17	4100	2832	155	20	10	5	11,398	4.8	57	--	15' C.T. Br.	
L-18	4300	780	53	13	3	5	6364	3.2	38	--	--	
L-19	2800	320	25	13	3	5	4144	2.1	38	--	--	
L-20	4500	320	25	13	3	5	6660	3.3	38	--	30' - 48"	
L-21	2000	276	22	13	3	5	2960	1.5	38	--	--	
L-22	6600	1008	66	14	4	5	11,022	5.3	41	--	15' C.T. Br.	
L-22	3200	1148	73	14	4	5	5344	2.6	41	--	--	
L-23	6100	800	54	13	3	5	9028	4.5	38	--	--	
L-23	5800	1200	76	15	5	5	10,730	5.1	44	--	--	
L-23	3200	4764	238	26	16	5	12,448	4.9	73	--	--	
L-23	700	6148	298	30	20	5	3241	1.3	84	--	45' R.C. Br. 45' R.C. Br.	
L-23	2100	6304	305	30	20	5	9723	3.8	84	--	45' R.C. Br.	
L-23	6000	7000	328	32	22	5	30,000	11.4	89	--	--	
L-23	8400	8032	370	36	26	5	48,216	17.9	99	--	--	
L-23	3600	8944	405	38	28	5	21,996	8.2	105	--	--	
L-24		928	Present canal as constructed is considered adequate							--	--	
L-25		1360	Present canal as constructed is considered adequate							--	--	
L-26	3900	700	49	13	3	5	5772	2.9	38	--	--	
L-26	4100	2368	133	18	8	5	9881	4.3	52	--	--	

ENGINEERING AND DESIGN DATA

Area 3 - Wassamassaw - Cooper's Store - New Hope - Lebanon

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-27	3700	396	30	13	3	5	5476	2.7	38	--	--	
L-27	2800	1144	73	14	4	5	4676	2.2	41	--	--	
L-27	2700	1344	84	15	5	5	4995	2.4	44	--	--	
L-28	5600	508	37	13	3	5	8288	4.1	38	--	--	
L-29	3500	216	18	13	3	5	5180	2.6	38	--	--	
L-30	7200	612	44	13	3	5	10,656	5.3	38	--	30' - 60"	
L-31	2600	472	33	13	3	5	3848	1.9	38	--	--	
L-31	2800	1068	68	14	4	5	4676	2.2	41	--	15' C.T. Br.	
L-31	9200	2128	123	18	8	5	22,172	9.7	52	--	15' C.T. Br. 15' C.T. Br.	
L-31	4500	3024	166	22	12	5	14,175	5.8	62	--	15' C.T. Br.	
L-31	2000	3360	179	22	12	5	6300	2.6	62	--	--	
L-31	3700	3688	193	24	14	5	13,024	5.3	68	--	30' C.T. Br.	
L-31	4900	4032	208	24	14	5	17,248	7.0	68	--	--	
L-31	2100	5668	275	28	18	5	6993	3.5	78	--	30' C.T. Br.	
L-31	4400	6056	293	30	20	5	20,372	7.9	84	--	--	
L-32	5000	400	31	13	3	5	7400	3.7	38	--	30' - 42"	
L-33	3700	240	20	13	3	5	5476	2.7	38	--	30' - 48"	
L-34	2100	304	24	13	3	5	3108	1.5	38	--	30' - 48"	
L-34	2800	564	40	13	3	5	4144	2.1	38	--	15' C.T. Br.	
L-34	2200	820	55	13	3	5	3256	1.6	38	--	15' C.T. Br.	
L-34	5700	1328	83	15	5	5	10,545	5.0	44	--	--	
L-35	2800	292	23	13	3	5	4144	2.1	38	--	30' - 48"	
L-35	3200	500	36	13	3	5	4736	2.4	38	--	--	
L-36	4700	308	24	13	3	5	6956	3.5	38	--	40' - 48"	
L-36	2200	428	32	13	3	5	3256	1.6	38	--	--	
L-36	3200	588	42	13	3	5	4736	2.4	38	--	15' C.T. Br.	
L-36	5100	1148	73	14	4	5	8517	4.1	41	--	--	
L-36	4900	1512	92	16	6	5	9996	4.5	46	--	--	
L-37	3200	296	23	13	3	5	4736	2.4	38	--	40' - 30"	
L-38	5500	320	25	13	3	5	8140	4.0	38	--	30' - 54"	
L-38	4200	476	35	13	3	5	6216	3.1	38	--	40' - 60"	
L-38	5800	844	57	13	3	5	8584	4.3	38	--	--	
L-38	4300	1116	71	14	4	5	7181	3.5	41	--	--	
Total-1	446,400						1,353,255	564.0				439,698.00
M-2	3600	468	34	13	3	5	5328	2.6	38	--	30' - 60"	
M-2	3100	2068	118	17	7	5	6882	3.1	49	--	--	
M-2	2500	2548	143	19	9	5	6475	2.8	55	--	15' C.T. Br.	
M-2	4200	2832	155	20	10	5	11,676	4.9	57	--	--	
M-2	2000	4016	207	19	9	5	5180	2.2	55	--	--	
M-2	3600	4304	222	20	10	5	10,008	4.2	57	--	--	
M-2	1500	4678	234	20	10	5	4170	1.8	57	--	--	
M-2	3000	7846	368	28	18	5	12,780	5.0	78	--	--	
M-2	3100	8266	381	28	18	5	13,206	5.1	78	--	--	
L-1		1052	Present canal as constructed is considered adequate							--	--	
L-2	1500	216	18	13	3	5	2220	1.1	38	--	40' - 42"	
L-2	3000	344	27	13	3	5	4440	2.2	38	--	--	

ENGINEERING AND DESIGN DATA

Area 3 - Wassamassaw - Cooper's Store - New Hope - Lebanon

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	BOTTOM WIDTH Ft. (6)	AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-3	4500	680	48	13	3	5	6660	3.3	38	--	15' C.T. Br.	
L-3	5000	1140	73	13	3	5	7400	3.7	38	--	--	
L-3	3100	2104	122	15	5	5	5735	2.7	44	--	--	
L-3	3200	2292	131	16	6	5	6528	2.9	46	--	--	
L-4	3900	400	30	13	3	5	5772	2.9	38	--	30' - 48"	
L-4	1100	756	52	13	3	5	1628	0.8	38	--	--	
L-5	3300	344	27	13	3	5	4884	2.4	38	--	30' - 48"	
L-6	2300	120	11	13	3	5	3404	1.7	38	--	--	
L-7	3000	316	25	13	3	5	4440	2.2	38	--	--	
L-7		612	Present canal as constructed is considered adequate							--	--	
Total-2	60,500						128.816	57.6				41,561.00
M-3	4000	360	27	13	3	5	5920	2.9	38	--	30' - 54"	
M-3	3600	552	40	13	3	5	5328	2.6	38	--	--	
Total-3	7600						11,248	5.5				4055.00
M-4	3700	472	35	13	3	5	5476	2.7	38	--	30' - 60"	
M-4	6400	760	52	13	3	5	9472	4.7	38	--	--	
M-4	6300	1128	72	13	3	5	9324	4.6	38	--	--	
Total-4	16.400						24.272	12.0				8112.00
M-5		2520	Present canal as constructed is considered adequate							--	--	
M-5	3400	2708	148	16	6	5	6936	3.1	46	--	30' U.T. Br.	
M-5	2900	5246	262	22	12	5	9135	3.7	62	--	--	
M-5	700	5736	282	24	14	5	2464	1.0	68	--	--	
M-5	4100	6172	299	24	14	5	14,432	5.8	68	--	--	
M-5	1000	6900	329	26	16	5	3890	1.5	73	--	--	
M-5	7500	7312	343	26	16	5	29,175	11.5	73	--	--	
L-1	5700	420	32	13	3	5	8436	4.2	38	--	30' - 42"	
L-1	4000	668	47	13	3	5	5920	2.9	38	--	15' U.T. Br. 30' - 60"	
L-1	2900	780	54	13	3	5	4292	2.1	38	--	--	
L-1	1300	2296	131	18	8	5	3133	1.4	52	--	--	
L-1	1300	2346	132	18	8	5	3133	1.4	52	--	--	
L-2	2300	368	28	13	3	5	3404	1.7	38	--	30' - 48" 30' - 42"	
L-2	1900	528	38	13	3	5	2812	1.4	38	--	20' - 48"	
L-2	4500	724	50	13	3	5	6660	3.3	38	--	15' U.T. Br.	
L-3	4000	512	37	13	3	5	5920	2.9	38	--	20' - 60"	
L-3	2500	672	47	13	3	5	3700	1.8	38	--	15' U.T. Br.	
L-3	1200	712	50	13	3	5	1776	0.9	38	--	15' U.T. Br.	
L-3	1200	742	51	13	3	5	1776	0.9	38	--	--	
L-4	2700	220	18	13	3	5	3996	2.0	38	--	--	
L-4	3800	440	33	13	3	5	5624	2.8	38	--	--	
L-5	1000	88	8	13	3	5	1480	0.7	38	--	40' - 36"	
L-5	2700	196	17	13	3	5	3996	2.0	38	--	--	
L-6	7800	328	25	13	3	5	11,544	5.7	38	40' - 18"	20' - 48"	
L-6	3100	668	44	13	3	5	4588	2.3	38	--	--	
L-7	3400	140	13	13	3	5	5032	2.5	38	--	--	
Total-5	76.900						153.254	69.5				52.097.00

ENGINEERING AND DESIGN DATA

Area 3 - Wassamassaw - Cooper's Store - New Hope - Lebanon

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-6	5700	248	20	13	3	5	8436	4.2	38	--	20' - 42"	
Total-6	5700						8436	4.2				2863.00
M-7	3200	264	21	13	3	5	4736	2.4	38	--	20' - 48"	
M-7	7100	776	53	13	3	5	10,508	5.2	38	--	15' R.C. Br.	
M-7	5100	1036	67	13	3	5	7548	3.7	38	--	15' R.C. Br.	
M-7	7000	1372	87	13	3	5	10,360	5.1	38	--	--	
Total-7	22,400						33,152	16.4				13,326.00
M-8	2900	292	23	13	3	5	4292	2.1	38	--	30' - 48"	
M-8	6000	612	43	13	3	5	8880	4.4	38	--	15' U.T. Br.	
M-8	5700	1188	76	13	3	5	8436	4.2	38	--	15' R.C. Br.	
M-8	1100	1228	77	13	3	5	1628	0.8	38	--	--	
M-8	1200	2616	147	16	6	5	2448	1.1	46	--	--	
M-8	3000	2956	162	17	7	5	6660	3.0	49	--	--	
M-8	5300	3248	175	17	7	5	11,766	5.2	49	--	--	
L-1	3500	540	34	13	3	5	5180	2.6	38	--	30' - 60"	
L-1	3700	768	52	13	3	5	5476	2.7	38	--	15' U.T. Br.	
L-1	6000	1128	72	13	3	5	8880	4.4	38	--	--	
L-1	3100	1268	79	13	3	5	4588	2.3	38	--	--	
Total-8	41,500						68,234	32.8				24,189.00
M-9	3300	544	39	13	3	5	4884	2.4	38	--	15' C.T. Br.	
M-9	3700	764	52	13	3	5	5476	2.7	38	--	15' C.T. Br.	
M-9	4700	948	62	13	3	5	6956	3.5	38	--	15' C.T. Br.	
M-9	700	1730	103	14	4	5	1169	0.6	41	--	15' C.T. Br.	
M-9	5300	1986	116	15	5	5	9805	4.6	44	--	15' U.T. Br.	
M-9	4500	2506	141	16	6	5	9180	4.1	46	--	--	
M-9	5200	2794	153	16	6	5	10,608	4.8	46	--	--	
L-1	4600	480	35	13	3	5	6808	3.4	38	--	--	
L-1	5300	752	52	13	3	5	7844	3.9	38	--	--	
Total-9	37,300						62,730	30.0				22,046.00
M-10	2500	288	23	13	3	5	3700	1.8	38	--	30' - 54"	
M-10	5400	652	46	13	3	5	7992	4.0	38	--	--	
M-10			Present canal as constructed is considered adequate							--	--	
Total-10	7900						11,692	5.8				4203.00
M-11	3400	480	35	13	3	5	5032	2.5	38	--	30' - 60"	
M-11	2900	604	43	13	3	5	4292	2.1	38	--	--	
M-11	4800	756	52	13	3	5	7104	3.5	38	--	15' C.T. Br.	
M-11	4700	1320	82	13	3	5	6956	3.5	38	--	15' R.C. Br.	
L-1	3100	128	12	13	3	5	4588	2.3	38	--	--	
L-1		316	Present canal as constructed is considered adequate							--	--	
Total-11	18,900						27,972	13.9				11,482.00
M-12	3400	412	31	13	3	5	5032	2.5	38	--	20' - 36"	
M-12	1000	462	34	13	3	5	1480	0.7	38	--	--	
M-12	5200	894	60	13	3	5	7696	3.8	38	--	15' C.T. Br.	
M-12	2800	1050	68	13	3	5	4144	2.1	38	--	--	
Total-12	12,400						18,352	9.1				6520.00

ENGINEERING AND DESIGN DATA

Area 3 - Wassamassaw - Cooper's Store - New Hope - Lebanon

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-13	3500	772	53	13	3	5	5180	2.6	38	--	15' U.T. Br.	
M-13	2800	1080	69	13	3	5	4144	2.1	38	--	15' R.C. Br.	
Total-13	6300						9324	4.7				4805.00
M-14	1600	80	8	13	3	5	2368	1.2	38	--	40' - 24"	
M-14	4600	176	15	13	3	5	6808	3.4	38	--	--	
Total-14	6200						9176	4.6				3047.00
M-15	2900	148	13	13	3	5	4292	2.1	38	--	--	
M-15	3300	420	32	13	3	5	4884	2.4	38	--	15' U.T. Br.	
L-1	3100	148	13	13	3	5	4588	2.3	38	--	--	
Total-15	9300						13,764	6.8				4613.00
M-16	1400	584	41	13	3	5	2072	1.0	38	--	--	
M-16	4400	972	64	13	3	5	6512	3.2	38	--	15' U.T. Br.	
M-16	900	1310	82	13	3	5	1332	0.7	38	--	--	
M-16	4100	1898	113	15	5	5	7585	3.6	44	--	--	
L-1	3100	308	24	13	3	5	4588	2.3	38	--	--	
L-2	4400	400	30	13	3	5	6512	3.2	38	--	15' U.T. Br.	
Total-16	18,300						28,601	14.0				9520.00
Area 3 Grand Total	794,000						1,962,278	850.9				652,137.00

ENGINEERING AND DESIGN DATA

Area 4 - Sand Ridge - Pringletown

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1	3800	536	37	13	3	5	5624	2.8	38	--	--	
M-1	1900	1088	70	14	4	5	3173	1.5	41	--	--	
M-1	4900	1872	111	17	7	5	10,878	4.8	49	--	--	
M-1	4400	2112	122	17	7	5	9768	3.8	49	--	--	
M-1	3700	4296	221	20	10	5	10,286	4.3	57	--	--	
L-1	2300	356	27	13	3	5	3404	1.7	38	--	--	
L-2	2400	288	23	13	3	5	3552	1.8	38	--	--	
L-3	2800	172	15	13	3	5	4144	2.1	38	--	--	
L-3	1000	416	31	13	3	5	1480	0.7	38	--	30' - 60"	
L-3	3800	716	46	13	3	5	5624	2.8	38	--	--	
L-3	1700	1088	70	14	4	5	2839	1.4	41	--	--	
L-3	900	1584	97	16	6	5	1836	0.8	46	--	15' R.C. Br	
L-3	4000	2004	116	17	7	5	8880	3.9	49	--	20' C.T. Br.	
L-4	1800	216	18	13	3	5	2664	1.3	38	--	--	
L-5	5200	292	23	13	3	5	7696	3.8	38	--	--	
L-6	5700	444	33	13	3	5	8436	4.2	38	--	30' - 48" 30' - 54"	
Total-1	50.300						90,284	41.7				31,084.00
M-2	4000	264	21	13	3	5	5920	2.9	38	--	--	
M-2	4100	524	38	13	3	5	6068	3.0	38	--	--	
Total-2	8100						11,988	5.9				3578.00
M-3	5900	200	17	13	3	5	8732	4.3	38	--	30' - 48"	
M-3	4500	516	38	13	3	5	6660	3.3	38	--	15' U.T. Br.	
M-3	4100	876	59	13	3	5	6068	3.0	38	--	50' - 54"	
M-3	3400	1028	67	13	3	5	5032	2.5	38	--	--	
Total-3	17,900						26,492	13.1				10,217.00
M-4	5200	340	26	13	3	5	7696	3.8	38	--	--	
M-4	5600	580	41	13	3	5	8288	4.1	38	--	60' - 54"	
M-4	2500	700	48	13	3	5	3700	1.8	38	--	--	
M-4	1400	876	59	13	3	5	2072	1.0	38	--	--	
L-1	2300	124	11	13	3	5	3404	1.7	38	50' - 36"	--	
Total-4	17,000						25,160	12.4				9272.00
M-5	3400	184	16	13	3	5	5032	2.5	38	--	60' - 24" 30' - 36"	
M-5	4400	352	27	13	3	5	6512	3.2	38	--	15' U.T. Br.	
M-5	2400	680	47	13	3	5	3552	1.8	38	--	15' C.T. Br.	
M-5	500	940	62	13	3	5	740	0.4	38	--	50' - 54"	
M-5	4600	1240	79	13	3	5	6808	3.4	38	--	--	
L-1	5000	288	23	13	3	5	7400	3.7	38	--	--	
L-2	3500	220	18	13	3	5	5180	2.6	38	--	--	
Total-5	23,800						35,224	17.6				13,848.00
M-6	3400	152	13	13	3	5	5032	2.5	38	--	--	
M-6	4100	612	43	13	3	5	6068	3.0	38	50' - 72"	--	
M-6	3300	796	54	13	3	5	4884	2.4	38	--	--	
L-1	2500	92	9	13	3	5	3700	1.8	38	--	30' - 36"	
Total-6	13,300						19,684	9.7				7489.00

ENGINEERING AND DESIGN DATA

Area 4 - Sand Ridge - Pringletown

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-7	3400	368	28	13	3	5	5032	2.5	38	--	--	
M-7	7100	928	61	13	3	5	10,508	5.2	38	--	15' U.T. Br.	
M-7	1300	1420	88	16	6	5	2652	1.2	46	--	--	
M-7	2200	1556	95	16	6	5	4488	2.0	46	--	--	
M-7	3500	1964	115	17	7	5	7770	3.5	49	--	--	
M-7	2600	2580	145	20	10	5	7228	3.0	57	--	--	
L-1	5600	440	33	13	3	5	8288	4.1	38	--	--	
L-2	2900	204	17	13	3	5	4292	2.1	38	--	--	
L-3	3900	240	20	13	3	5	5772	2.9	38	--	30' - 48"	
L-3	2100	300	24	13	3	5	3108	1.5	38	--	--	
Total-7	34,600						59,138	28.0				18,552.00
M-8	6700	456	33	13	3	5	9916	4.9	38	--	--	
M-8	1400	524	38	13	3	5	2072	1.0	38	--	--	
M-8	2500	784	54	13	3	5	3700	1.8	38	--	--	
M-8	5400	1572	96	16	6	5	11,016	5.0	46	--	15' U.T. Br.	
M-8	1800	1916	112	16	6	5	3672	1.7	46	--	--	
M-8	1900	1996	115	15	5	5	3515	1.7	44	--	--	
L-1	3800	168	14	13	3	5	5624	2.8	38	--	--	
L-2	3000	204	17	13	3	5	4440	2.2	38	--	--	
L-2	3400	432	33	13	3	5	5032	2.5	38	--	--	
L-3	2500	96	9	13	3	5	3700	1.8	38	--	--	
L-3	1400	244	20	13	3	5	2072	1.0	38	--	--	
L-4	2400	112	11	13	3	5	3552	1.8	38	--	30' - 36"	
Total-8	36,200						58,311	28.2				18,222.00
M-9		228	Present canal as constructed is considered adequate							--	30' - 48"	
M-9	3900	468	34	13	3	5	5772	2.9	38	--	30' - 60"	
											30' - 60"	
Total-9	3900						5772	2.9				4074.00
M-10	4900	468	34	13	3	5	7252	3.6	38	--	--	
M-10	5500	800	54	13	3	5	8140	4.0	38	--	15' U.T. Br.	
M-10	3400	1116	71	14	4	5	5678	2.7	41	--	15' C.T. Br.	
M-10	700	1284	81	13	3	5	1036	0.5	38	--	--	
M-10	800	1420	88	13	3	5	1184	0.6	38	--	--	
L-1	5400	240	20	13	3	5	7992	4.0	38	--	15' U.T. Br.	
L-2	3900	128	12	13	3	5	5772	2.9	38	--	--	
L-3	1500	76	7	13	3	5	2220	1.1	38	--	40' - 18"	
L-3	1800	116	11	13	3	5	2664	1.3	38	--	--	
Total-10	27,900						41,938	20.7				14,462.00
M-11	5500	368	28	13	3	5	8140	4.0	38	--	40' - 48"	
M-11	1200	460	34	13	3	5	1776	0.9	38	--	--	
M-11	2900	832	56	13	3	5	4292	2.1	38	--	15' C.T. Br.	
M-11	2000	952	63	13	3	5	2960	1.5	38	--	--	
M-11	6300	1760	105	16	6	5	12,852	5.8	46	--	--	
M-11	5800	3088	169	22	12	5	18,270	7.5	62	--	30' C.T. Br.	
L-1	1800	108	10	13	3	5	2664	1.3	38	--	30' - 30"	
L-1	1900	184	16	13	3	5	2812	1.4	38	--	40' - 42"	

ENGINEERING AND DESIGN DATA

Area 4 - Sand Ridge - Pringletown

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-2	3600	240	20	13	3	5	5328	2.6	38	--	--	
L-3	4700	476	35	13	3	5	6956	3.5	38	--	--	
L-3	4800	952	63	13	3	5	7104	3.5	38	--	15' C.T. Br.	
Total-11	40,500						73,154	34.1				26,261.00
M-12	3100	316	25	13	3	5	4588	2.3	38	--	40' - 36"	
M-12	3200	444	33	13	3	5	4736	2.4	38	--	--	
Total-12	6300						9324	4.7				3365.00
M-13	5100	720	50	13	3	5	7548	3.7	38	50' - 36"	30' - 42"	
Total-13	5100						7548	3.7				3104.00
Area 4 Grand Total	284,900						464,017	222.7				163,528.00

ENGINEERING AND DESIGN DATA

Area 5 - Cross

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1	5600	860	58	15	5	5	10,360	4.9	44	--	--	
M-1	6200	1700	102	19	9	5	16,058	7.0	55	--	15' C.T. Br.	
M-1	1700	1840	109	19	9	5	4403	1.9	55	--	15' R.C. Br.	
L-1	4800	460	34	13	3	5	7104	3.5	38	--	--	
Total-1	18,300						37,925	17.3				13,295.00
M-2	4700	360	27	13	3	5	6956	3.5	38	--	--	
M-2	3000	958	63	13	3	5	4440	2.2	38	--	15' R.C. Br.	
M-2	3500	1182	76	14	4	5	5845	2.8	41	--	--	
M-2	3500	1650	99	16	6	5	7140	3.2	46	--	15' R.C. Br.	
L-1	3600	266	22	13	3	5	5328	2.6	38	--	--	
L-2	4500	276	22	13	3	5	6660	3.3	38	--	--	
Total-2	22,800						36,369	17.6				13,794.00
M-3	7200	556	40	13	3	5	10,656	5.3	38	--	15' R.C. Br.	
M-3	3100	696	49	13	3	5	4588	2.3	38	--	--	
Total-3	10,300						15,244	7.6				6069.00
M-4	1400	40	6	13	3	5	2072	1.0	38	--	--	
M-4	2100	302	24	13	3	5	3108	1.5	38	--	40' - 36"	
L-1	2600	170	15	13	3	5	3848	1.9	38	--	--	
Total-4	6100						9028	4.4				3246.00
M-5	5300	440	33	13	3	5	7844	3.9	38	--	15' U.T. Br.	
M-5	1400	720	50	13	3	5	2072	1.0	38	--	15' U.T. Br.	
M-5	2100	840	56	13	3	5	3108	1.5	38	--	15' U.T. Br.	
M-5	400	864	58	13	3	5	592	0.3	38	--	15' R.C. Br.	
L-1	2200	124	11	13	3	5	3256	1.6	38	--	--	
Total-5	11,400						16,872	8.3				8034.00
M-6	7200	460	34	13	3	5	10,656	5.3	38	--	30' - 48"	
M-6	4300	620	44	13	3	5	6364	3.2	38	--	15' C.T. Br. 15' R.C. Br.	
M-6	2000	708	49	13	3	5	2960	1.5	38	--	15' C.T. Br.	
M-6	2000	1150	74	16	6	5	4080	1.8	46	--	--	
L-1	2000	200	17	13	3	5	2960	1.5	38	--	30' - 30"	
L-1	2600	310	24	13	3	5	3848	1.9	38	--	--	
Total-6	20,100						30,868	15.2				13,144.00
M-7	3000	140	13	13	3	5	4440	2.2	38	--	30' - 30"	
M-7	300	204	17	13	3	5	444	0.2	38	--	40' - 36"	
M-7	2700	380	29	13	3	5	3996	2.0	38	--	30' - 60"	
M-7	3900	540	39	13	3	5	5772	2.9	38	--	--	
L-1	900	44	5	13	3	5	1332	0.7	38	--	--	
Total-7	10,800						15,984	8.0				6521.00
M-8	1000	48	5	13	3	5	1480	0.7	38	--	30' - 24"	
M-8	3000	132	12	13	3	5	4440	2.2	38	--	50' - 24" 30' - 36"	
M-8	900	188	16	13	3	5	1332	0.7	38	--	30' - 42"	
M-8	500	200	17	13	3	5	740	0.4	38	--	--	
M-8	2400	298	24	13	3	5	3552	1.8	38	--	--	
M-8	500	350	27	13	3	5	740	0.4	38	--	--	

ENGINEERING AND DESIGN DATA

Area 5 - Cross

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-1	1100	18	2	13	3	5	1628	0.8	38	--	30' - 18"	
L-2	2500	44	5	13	3	5	3700	1.8	38	--	--	
Total-8	11,900						17,612	8.8				6928.00
M-9	3500	154	13	13	3	5	5180	2.6	38	--	30' - 30"	
M-9	1000	358	27	13	3	5	1480	0.7	38	--	--	
M-9	1300	534	38	13	3	5	1924	1.0	38	--	15' U.T. Br. 40' - 30"	
M-9	1100	670	47	13	3	5	1628	0.8	38	--	15' C.T. Br.	
M-9	3300	754	51	13	3	5	4884	2.4	38	--	--	
L-1	3900	164	14	13	3	5	5772	2.9	38	--	--	
L-2	1400	28	3	13	3	5	2072	1.0	38	--	--	
Total-9	15,500						22,940	11.4				8832.00
M-10	800	84	8	13	3	5	1184	0.6	38	--	30' - 36"	
M-10	600	90	8	13	3	5	888	0.4	38	--	--	
M-10	2000	182	15	13	3	5	2960	1.5	38	--	--	
L-1	700	24	3	13	3	5	1036	0.5	38	20' - 18"	--	
Total-10	4100						6068	3.0				2280.00
M-11	4700	248	20	13	3	5	6956	3.5	38	--	30' - 48"	
M-11	2900	358	27	13	3	5	4292	2.1	38	--	--	
Total-11	7600						11,248	5.6				3994.00
M-12	3500	252	20	13	3	5	5180	2.6	38	--	--	
M-12	5300	756	52	13	3	5	7844	3.9	38	--	15' C.T. Br.	
M-12	1000	892	60	14	4	5	1670	0.8	41	--	--	
M-12	400	1118	72	16	6	5	816	0.4	46	--	15' R.C. Br.	
M-12	2000	1194	76	16	6	5	4080	1.8	46	--	15' C.T. Br. 15' U.T. Br.	
M-12	3000	1302	81	16	6	5	6120	1.4	46	--	--	
M-12	1200	1552	95	17	7	5	2664	1.2	49	--	--	
M-12	500	2280	130	20	10	5	1390	0.6	57	--	15' C.T. Br.	
L-1	3500	280	22	13	3	5	5180	2.6	38	--	--	
L-2	3000	96	9	13	3	5	4440	2.2	38	--	--	
L-3	3300	88	9	13	3	5	3663	2.4	38	--	--	
L-3	2400	196	17	13	3	5	2664	1.8	38	--	30' - 42"	
L-4	2200	68	7	13	3	5	3256	1.6	38	--	--	
L-5		220	Present canal as constructed is considered adequate							--	--	
L-6	4000	280	22	13	3	5	5920	2.9	38	--	40' - 42"	
L-6		708	Present canal as constructed is considered adequate							--	--	
Total-12	35,300						54,887	26.2				21,643.00
M-13	5100	220	18	13	3	5	7548	3.7	38	--	--	
M-13	500	415	31	13	3	5	740	0.2	38	--	--	
M-13	900	605	43	13	3	5	1332	0.4	38	--	40' - 48"	
M-13	5000	925	61	14	4	5	8350	4.0	41	--	--	
M-13	500	1105	71	15	5	5	925	0.4	44	--	15' C.T. Br.	
M-13	2800	1245	78	16	6	5	5712	2.6	46	--	--	
L-1	4100	180	15	13	3	5	6068	3.0	38	--	30' - 42" 60' - 30"	

ENGINEERING AND DESIGN DATA

Area 5 - Cross

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-2		170	Present canal as constructed is considered adequate							--	--	
L-3	3500	160	14	13	3	5	5180	2.6	38	--	30' - 36"	
Total-13	22,400						35,855	16.9				13,669.00
M-14	3400	408	31	13	3	5	5032	2.5	38	--	40' - 48"	
M-14	1400	508	37	13	3	5	2072	1.0	38	--	15' C.T. Br.	
M-14	3300	664	47	13	3	5	4884	2.4	38	--	--	
Total-14	8100						11,988	5.9				5160.00
M-15	7200	500	36	13	3	5	10,656	5.3	38	--	--	
M-15	2300	832	56	14	4	5	3841	1.9	41	--	40' - 54"	
M-15	1400	896	60	15	5	5	2590	1.2	44	--	--	
M-15	4600	1256	78	16	6	5	9384	4.2	46	--	15' U.T. Br.	
L-1	3500	180	15	13	3	5	5180	2.6	38	--	60' - 30"	
L-2	2600	148	13	13	3	5	3848	1.2	38	--	30' - 42"	
											40' - 24"	
Total-15	21,600						35,499	16.4				13,228.00
M-16		732	Present canal as constructed is considered adequate							--	--	
M-16		2392	Present canal as constructed is considered adequate							--	--	
M-16		2564	Present canal as constructed is considered adequate							--	--	
M-16		4104	Present canal as constructed is considered adequate							--	--	
M-16		4468	Present canal as constructed is considered adequate							--	15' R.C. Br.	
L-1	8900	580	9	13	3	5	13,172	6.5	38	--	--	
L-2		592	Present canal as constructed is considered adequate							--	--	
L-3		592	Present canal as constructed is considered adequate							--	--	
L-4	3800	168	3	13	3	5	5624	2.8	38	--	--	
Total-16	12,700						18,796	9.3				7119.00
M-17	5800	584	9	13	3	5	8584	4.3	38	--	--	
M-17	8300	1236	17	13	3	5	12,284	6.1	38	--	--	
M-17	4300	2200	28	13	3	5	6364	3.2	38	--	15' R.C. Br.	
											15' C.T. Br.	
M-17	4500	2680	33	13	3	5	6660	3.3	38	--	--	
M-17	5200	5148	257	26	16	5	20,228	8.0	73	--	--	
L-1		676	Present canal as constructed is considered adequate							--	30" - 60"	
L-2	7500	672	10	13	3	5	11,100	5.5	38	--	--	
L-2	7300	1232	17	13	3	5	10,804	5.4	38	--	--	
L-2	300	1856	110	22	12	5	945	0.4	62	--	--	
L-2	2500	1928	113	22	12	5	7875	3.2	62	--	--	
L-3	5800	432	33	13	3	5	8584	4.3	38	--	15' U.T. Br.	
L-3	4500	608	43	14	4	5	7515	3.6	41	--	--	
Total-17	56,000						100,943	47.3				34,757.00
Area 5 Grand Total	295,000						478,126	229.2				181,713.00

ENGINEERING AND DESIGN DATA

Area 6 - Eadytown - Pineville - St. Stephen

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	BOTTOM WIDTH Ft. (6)	AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1		Due to normal elevation of water in Lake Moultrie no improvements are recommended										
M-2	2200	100	10	13	3	5	3256	1.6	38	--	40' - 36"	
M-2	1400	132	12	13	3	5	2072	1.0	38	--	--	
M-2	3100	774	53	15	5	5	5735	2.7	44	--	--	
M-2	1600	1060	69	17	7	5	3552	1.6	49	--	--	
M-2	8200	2094	121	24	14	5	28,864	11.7	68	--	15' C.T. Br.	
M-2	1600	2142	124	19	9	5	4144	1.8	55	--	30' R.C. Br.	
M-2	5700	2458	138	16	6	5	11,628	5.2	46	--	--	
M-2	2100	4584	233	22	12	5	6615	2.7	62	--	--	
L-1	2600	304	24	13	3	5	3848	1.9	38	--	40' - 54"	
L-1	2200	504	37	13	3	5	3256	1.6	38	--	15' C.T. Br.	
L-1	1500	530	38	13	3	5	2220	1.1	38	--	--	
L-2	4000	246	20	13	3	5	5920	2.9	38	--	30' - 36"	
L-3	4300	254	21	13	3	5	6364	3.2	38	--	30' - 36"	
L-4	1300	50	5	13	3	5	1924	1.0	38	--	30' - 24"	
L-4	2000	110	10	13	3	5	2960	1.5	38	--	--	
L-5	600	56	6	13	3	5	888	0.4	38	--	40' - 24"	
L-5	700	104	10	13	3	5	1036	0.5	38	--	--	
L-5	4100	644	45	14	4	5	6847	3.3	41	120' - 36"	40' - 30"	
L-5	3800	926	62	13	3	5	5624	2.8	38	--	--	
L-5	4000	1286	80	15	5	5	7400	3.5	44	--	15' U.T. Br.	
L-5	4500	1882	112	15	5	5	8325	3.9	44	--	--	
L-6	2200	76	8	13	3	5	3256	1.6	38	--	--	
L-7	800	40	4	13	3	5	1184	0.6	38	40' - 30"	--	
L-7	400	48	5	13	3	5	592	0.3	38	--	30' - 30"	
L-7	3000	88	9	13	3	5	4440	2.2	38	--	30' - 30"	
L-8	700	40	4	13	3	5	1036	0.5	38	--	40' - 18"	
L-8	4300	224	19	13	3	5	6364	3.2	38	--	30' - 48"	
L-9		66		Present canal as constructed is considered adequate						--	--	
L-9		318		Present canal as constructed is considered adequate						--	20' - 48"	
L-9		376		Present canal as constructed is considered adequate						--	--	
L-9	3400	496	36	13	3	5	5032	2.5	38	--	--	
L-10		140		Present canal as constructed is considered adequate						--	--	
Total-2	76,300						144,382	66.8				53,375.00
M-3		258		Present canal as constructed is considered adequate						--	--	
M-3		502		Present canal as constructed is considered adequate						--	--	
M-3		1242		Present canal as constructed is considered adequate						--	--	
M-3		1360		Present canal as constructed is considered adequate						--	--	
M-3		1520		Present canal as constructed is considered adequate						--	15' R.C. Br.	
M-3		1594		Present canal as constructed is considered adequate						--	--	
M-3	5100	1790	106	15	5	5	9435	4.4	44	--	15' U.T. Br.	
M-3	3900	2790	153	16	6	5	5967	3.6	46	--	15' C.T. Br.	
L-1	2400	136	12	13	3	5	3552	1.8	38	--	--	
L-2	3900	296	23	13	3	5	5772	2.9	38	--	20' - 48"	
L-3	500	16	2	13	3	5	740	0.4	38	--	--	
L-3	3000	264	23	13	3	5	4440	2.2	38	--	--	
L-4	1800	84	8	13	3	5	2664	1.3	38	--	--	

ENGINEERING AND DESIGN DATA

Area 6 - Eadytown - Pineville - St. Stephen

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-5	1500	36	4	13	3	5	2220	1.1	38	--	20' - 24"	
L-6	2000	76	8	13	3	5	2960	1.5	38	--	20' - 30"	
L-7		418	Present canal as constructed is considered adequate							--	--	
L-7		686	Present canal as constructed is considered adequate							--	--	
L-8	6200	240	20	13	3	5	9176	4.6	38	--	20' - 36"	
Total-3	30,300						46,926	23.8				17,941.00
M-4	4500	350	27	13	3	5	6660	3.3	38	--	40' - 48" 20' - 42"	
M-4	1600	370	28	13	3	5	2368	1.2	38	--	--	
M-4	300	524	38	13	3	5	444	0.2	38	--	--	
M-4	6100	920	61	13	3	5	9028	4.5	38	--	--	
L-1	2200	80	8	13	3	5	3256	1.6	38	--	40' - 24"	
L-1	400	140	13	13	3	5	592	0.3	38	--	--	
L-2	1800	52	5	13	3	5	2664	1.3	38	--	--	
Total-4	16,900						25,012	12.4				8942.00
M-5	2000	120	11	13	3	5	2960	1.5	38	40' - 36"	--	
M-5	4600	556	40	13	3	5	6808	3.4	38	--	15' U.T. Br.	
M-5	5700	978	64	13	3	5	8436	4.2	38	--	--	
Total-5	12,300						18,204	9.1				6241.00
M-6	3100	172	15	13	3	5	4588	2.3	38	--	50' - 36"	
M-6	7500	528	38	13	3	5	11,100	5.5	38	--	15' U.T. Br. 15' U.T. Br.	
M-6	1500	1060	69	13	3	5	2220	1.1	38	--	--	
M-6	2800	2044	118	15	5	5	5180	2.4	44	--	15' U.T. Br.	
L-1		36	Present canal as constructed is considered adequate							--	--	
L-1		194	Present canal as constructed is considered adequate							--	20' - 36"	
L-1	4500	450	33	13	3	5	6660	3.3	38	--	--	
L-2	1600	66	7	13	3	5	2368	1.2	38	--	--	
L-2	6200	718	49	13	3	5	9176	4.6	38	--	15' U.T. Br.	
L-2	3300	878	59	13	3	5	4884	2.4	38	--	--	
L-3	1400	124	11	13	3	5	2072	1.0	38	--	--	
Total-6	31,900						48,248	23.8				17,390.00
M-7	1200	54	5	13	3	5	1776	0.9	38	--	30' - 24"	
M-7	6600	720	50	13	3	5	9768	4.8	38	--	15' U.T. Br. 15' U.T. Br.	
M-7	900	738	51	13	3	5	1332	0.7	38	--	--	
M-7	1600	1564	95	16	6	5	3264	1.5	46	--	--	
M-7	400	1792	106	16	6	5	816	0.4	46	--	--	
M-7	800	2020	117	17	7	5	1776	0.8	49	--	--	
M-7	3900	2396	135	18	8	5	9399	4.1	52	--	30' C.T. Br.	
M-7	1200	2436	137	18	8	5	2892	1.3	52	--	--	
M-7	2000	4082	210	24	14	5	7040	2.8	68	--	--	
M-7	2100	4406	227	26	16	5	8169	3.2	73	--	30' C.T. Br.	
M-7	1100	5552	273	28	18	5	4686	1.8	78	--	30' R.C. Br.	
M-7	5300	5902	286	30	20	5	24,539	9.5	84	--	--	
M-7	400	6366	308	32	22	5	2000	0.8	89	--	--	

ENGINEERING AND DESIGN DATA

Area 6 - Eadytown - Pineville - St. Stephen

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-7	4700	8188	377	36	26	5	26,978	10.0	99	--	--	
L-1	5400	500	36	13	3	5	7992	4.0	38	--	15' U.T. Br.	
L-1	500	506	37	13	3	5	740	0.4	38	--	--	
L-2	3400	224	19	13	3	5	5032	2.5	38	--	20' - 48"	
L-3	2300	208	18	13	3	5	3404	1.7	38	--	20' - 48"	
L-4	3900	154	14	13	3	5	5772	2.9	38	--	20' - 42"	
L-4	4000	618	44	13	3	5	5920	2.9	38	--	15' U.T. Br. 15' U.T. Br.	
L-4	1300	666	46	13	3	5	1924	1.0	38	--	--	
L-4	900	1414	87	16	6	5	1836	0.8	46	--	--	
L-5	3900	278	22	13	3	5	5772	2.9	38	--	15' U.T. Br.	
L-6	4300	482	35	13	3	5	6364	3.2	38	--	20' - 42"	
L-6	1300	722	50	13	3	5	1924	1.0	38	--	--	
L-7	4600	200	17	13	3	5	6808	3.4	38	--	20' - 42"	
L-8	3800	176	15	13	3	5	5624	2.8	38	--	20' - 36"	
L-9	700	38	4	13	3	5	1036	0.5	38	--	--	
L-9	8700	848	57	13	3	5	12,876	6.4	38	--	--	
L-9	1500	978	64	14	4	5	2505	1.2	41	--	--	
L-10	700	24	3	13	3	5	1036	0.5	38	--	--	
L-10	700	82	8	13	3	5	1036	0.5	38	--	20' - 30"	
L-10	900	162	17	13	3	5	1332	0.7	38	--	--	
L-11	1900	38	4	13	3	5	2812	1.4	38	--	--	
L-12	1600	82	8	13	3	5	2368	1.2	38	--	40' - 24"	
L-12	4200	218	18	13	3	5	6216	3.1	38	--	--	
L-13	4500	234	19	13	3	5	6660	3.3	38	--	20' - 30"	
L-14	2600	128	12	13	3	5	3848	1.9	38	--	30' - 36"	
L-14	1900	312	25	13	3	5	2812	1.4	38	--	--	
L-14	2800	608	43	13	3	5	4144	2.1	38	--	15' U.T. Br.	
L-14	700	748	51	13	3	5	1036	0.5	38	--	15' C.T. Br.	
L-14	1000	872	58	13	3	5	1480	0.7	38	--	--	
L-14	800	964	63	14	4	5	1336	0.6	41	--	15' C.T. Br.	
L-14	2300	1180	75	14	4	5	3841	1.7	41	--	--	
L-14	600	1382	85	15	5	5	1110	0.5	44	--	--	
L-14	1500	1460	89	16	6	5	3060	1.4	46	--	--	
L-14	500	1470	90	16	6	5	1020	0.5	46	--	--	
L-15	1000	78	8	13	3	5	1480	0.7	38	--	30' - 30"	
L-16	2600	76	8	13	3	5	3848	1.9	38	--	--	
L-17	500	20	2	13	3	5	740	0.4	38	--	40' - 18"	
L-17	1400	54	5	13	3	5	2072	1.0	38	--	--	
L-18	800	68	7	13	3	5	1184	0.6	38	--	40' - 24"	
L-18	1200	104	10	13	3	5	1776	0.9	38	--	20' - 36"	
L-19	800	64	7	13	3	5	1184	0.6	38	40' - 36"	--	
L-19	700	70	7	13	3	5	1036	0.5	38	--	--	
L-20	400	22	2	13	3	5	592	0.3	38	20' - 18"	--	
L-20	2800	174	15	13	3	5	4144	2.1	38	--	20' - 42"	
Total-7	124,100						242,987	111.2				87,056.00

ENGINEERING AND DESIGN DATA

Area 6 - Eadytown - Pineville - St. Stephen

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	BOTTOM WIDTH Ft. (6)	AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-8	6600	372	28	13	3	5	9768	4.8	38	--	30' - 54"	
M-8	2900	556	40	13	3	5	4292	2.1	38	--	--	
M-8	5800	932	65	13	3	5	8584	4.3	38	--	15' U.T. Br.	
M-8	4800	1128	72	13	3	5	7104	3.5	38	--	--	
L-1	1700	24	3	13	3	5	2516	1.2	38	--	--	
L-2	1700	30	3	13	3	5	2516	1.2	38	--	--	
Total-8	23,500						34,780	17.1				11,581.00
M-9	2500	88	9	13	3	5	3700	1.8	38	--	40' - 30"	
M-9	3000	248	20	13	3	5	4440	2.2	38	--	--	
M-9	2600	568	40	14	4	5	4342	2.1	41	--	--	
M-9	500	634	45	13	3	5	740	0.4	38	--	15' R.C. Br.	
M-9	3700	822	55	13	3	5	5476	2.7	38	--	--	
M-9	1900	1250	79	13	3	5	2812	1.4	38	--	15' U.T. Br.	
L-1	3900	180	15	13	3	5	5772	2.9	38	--	20' - 42"	
L-2	3100	118	11	13	3	5	4588	2.3	38	--	--	
L-2	1100	174	15	13	3	5	1628	0.8	38	--	30' - 42"	
L-2	4000	362	28	13	3	5	5920	2.9	38	--	15' U.T. Br. 15' U.T. Br.	
L-2	500	370	28	13	3	5	740	0.4	38	--	--	
Total-9	26,800						40,158	19.9				16,260.00
M-10	500	20	2	13	3	5	740	0.4	38	20' - 15"	--	
M-10	5700	246	20	13	3	5	8436	4.2	38	--	--	
Total-10	6200						9176	4.6				2791.00
M-11	600	60	6	13	3	5	888	0.4	38	--	30' - 30"	
M-11	3000	232	19	13	3	5	4440	2.2	38	--	20' - 42"	
M-11	2200	1152	74	14	4	5	3674	1.8	41	--	40' - 54"	
M-11	3400	1512	92	16	6	5	6936	3.1	46	--	40' - 48"	
M-11	1500	1580	96	16	6	5	3060	1.4	46	--	15' R.C. Br.	
M-11	1800	1652	99	16	6	5	3672	1.7	46	--	--	
M-11	4600	1980	116	16	6	5	9384	4.2	46	--	--	
L-1	4800	600	43	13	3	5	6808	3.4	38	--	40' - 66"	
L-1	1500	632	44	13	3	5	2220	1.1	38	--	--	
L-2	1500	48	5	13	3	5	2220	1.1	38	40' - 24"	--	
L-2	2600	120	11	13	3	5	3848	1.9	38	--	30' - 24"	
L-3	1700	60	7	13	3	5	2516	1.2	38	--	30' - 24"	
Total-11	29,000						49,666	23.5				20,587.00
M-12	1800	178	15	13	3	5	2664	1.3	38	--	--	
M-12	2100	306	25	13	3	5	3108	1.5	38	--	40' - 42"	
M-12	4900	560	40	13	3	5	7252	3.6	38	--	--	
Total-12	8800						13,024	6.4				4557.00
M-13	2100	88	17	13	3	5	3108	1.5	38	40' - 18" 40' - 24"	40' - 24"	
M-13	1500	370	57	13	3	5	2220	1.1	38	--	40' - 42" 40' - 48" 40' - 42"	

ENGINEERING AND DESIGN DATA

Area 6 - Eadytown - Pineville - St. Stephen

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-13	1200	466	69	14	4	5	2004	1.0	41	--	50' - 36"	
											40' - 60'	
M-13	2000	550	79	15	5	5	3700	1.7	44	80' - 48"	15' R.C. Br.	
M-13	3700	678	94	14	4	5	6179	3.0	41	--	--	
L-1	1900	128	23	13	3	5	2812	1.4	38	--	--	
Total-13	12,400						20,023	9.7				12,827.00
M-14	1500	68	14	13	3	5	2220	1.1	38	40' - 30"	--	
M-14	3000	176	31	13	3	5	4440	2.2	38	--	--	
Total-14	4500						6660	3.3				2196.00
M-15	4900	228	38	13	3	5	7252	3.6	38	--	20' - 48"	
M-15	1200	568	82	15	5	5	2220	1.0	44	--	--	
M-15	900	608	85	15	5	5	1665	0.8	44	--	15' C.T. Br.	
M-15	2300	740	102	15	5	5	4255	2.0	44	--	100' - 54"	
											15' R.C. Br.	
M-15	700	832	112	15	5	5	1295	0.6	44	--	--	
L-1		252	Present canal as constructed is considered adequate							--	--	
Total-15	10.000						16,687	8.0				9953.00
Area 6 Grand Total	413,000						715,303	339.6				271,697.00

ENGINEERING AND DESIGN DATA

Area 7 - St. Stephen - Alvin - Jamestown

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	BOTTOM WIDTH Ft. (6)	AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1	900	56	6	13	3	5	1332	0.7	38	--	40' - 24"	
M-1	1400	96	9	13	3	5	2072	1.0	38	--	--	
M-1	4400	400	30	13	3	5	6512	3.2	38	--	--	
L-1	900	64	7	13	3	5	1332	0.7	38	--	30' - 30"	
L-1	600	78	8	13	3	5	888	0.4	38	--	30' - 30"	
L-1	500	88	9	13	3	5	740	0.4	38	--	--	
Total-1	8700						12,876	6.4				4759.00
M-2	900	40	4	13	3	5	1332	0.7	38	--	30' - 18"	
M-2	1700	166	15	13	3	5	2516	1.2	38	--	--	
M-2	4000	346	27	13	3	5	5920	2.9	38	--	--	
Total-2	6600						9768	4.8				3052.00
M-3	4000	248	20	13	3	5	5920	2.9	38	--	30' - 18"	
M-3	1000	268	22	13	3	5	1480	0.7	38	--	--	
M-3	1800	452	33	13	3	5	2664	1.3	38	--	--	
L-1	1500	92	9	13	3	5	2220	1.1	38	--	30' - 36"	
Total-3	8300						12,284	6.0				4215.00
M-4	4000	240	20	13	3	5	5920	2.9	38	--	40' - 36"	
M-4	2300	296	23	13	3	5	3404	1.7	38	--	--	
M-4	1100	456	33	13	3	5	1628	0.8	38	--	--	
L-1	1400	64	7	13	3	5	2072	1.0	38	--	30' - 24" 40' - 18"	
L-1	2300	112	11	13	3	5	3404	1.7	38	--	--	
Total-4	11,100						16,428	8.1				5869.00
M-5	3800	352	27	13	3	5	5624	2.8	38	--	50' - 48"	
M-5	3800	522	38	13	3	5	5624	2.8	38	--	--	
Total-5	7600						11,248	5.6				4410.00
M-6	2600	348	27	13	3	5	3848	1.9	38	--	30' - 54"	
M-6	2900	672	47	13	3	5	4292	2.1	38	--	40' - 36"	
M-6	1300	1020	67	14	4	5	2171	1.0	41	--	--	
M-6	1500	1688	102	16	6	5	3060	1.4	46	--	--	
M-6	5000	2088	119	15	5	5	9250	4.4	44	--	--	
L-1	900	116	11	13	3	5	1332	0.7	38	--	30' - 36"	
L-1	1900	208	18	13	3	5	2812	1.4	38	--	30' - 42"	
L-1	4300	552	40	13	3	5	6364	3.2	38	--	30' - 60"	
Total-6	20,400						33,129	16.1				12,893.00
M-7	1700	296	23	13	3	5	2516	1.2	38	--	30' - 48"	
M-7	2500	602	43	13	3	5	3700	1.8	38	--	40' - 60"	
M-7	2700	1070	69	14	4	5	4509	2.2	41	--	40' - 48"	
M-7	5200	1294	81	15	5	5	9620	4.5	44	--	--	
M-7	1400	2286	130	18	8	5	3374	1.5	52	--	--	
M-7	2000	3340	177	22	12	5	6300	2.6	62	--	--	
M-7	3000	8982	400	38	28	5	18,330	6.8	105	--	--	
M-7	5400	10,370	462	45	35	5	39,960	14.6	124	--	--	
M-7	5100	10,778	472	45	35	5	37,740	13.8	124	--	--	
M-7	2500	15,058	635	42	32	5	17,125	6.3	116	--	--	
L-1	2100	120	11	13	3	5	3108	1.5	38	--	-	

ENGINEERING AND DESIGN DATA

Area 7 - St. Stephen - Alvin - Jamestown

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-1	3900	658	46	13	3	5	5772	2.9	38	--	15' C.T. Br.	
L-1	1400	952	63	14	4	5	2338	1.2	44	--	--	
L-2	2800	312	25	13	3	5	4144	2.1	38	--	40' - 42"	
L-3	3800	252	20	13	3	5	5624	2.8	38	--	30' - 24"	
L-4	1700	140	13	13	3	5	2516	1.2	38	--	30' - 42"	
L-4	1700	220	18	13	3	5	2516	1.2	38	--	--	
L-4	300	368	28	13	3	5	444	0.2	38	--	--	
L-4	5100	876	59	13	3	5	7548	3.7	38	--	15' C.T. Br.	
L-4	2200	940	62	13	3	5	3256	1.6	38	--	--	
L-5	1500	140	13	13	3	5	2220	1.1	38	--	--	
L-6	3300	124	11	13	3	5	4884	2.4	38	--	--	
L-7	4300	406	31	13	3	5	6364	3.2	38	--	30' - 54"	
L-7	2800	528	38	13	3	5	4144	2.1	38	--	30' - 60"	
L-7	4700	956	63	14	4	5	7849	3.5	38	--	15' C.T. Br.	
L-7	3100	1208	76	15	5	5	5735	2.7	44	--	--	
L-7	1500	2484	140	19	9	5	3885	1.7	55	--	--	
L-7	3100	4040	208	24	14	5	10,912	4.4	68	--	--	
L-7	3300	5510	271	28	18	5	14,058	5.5	78	--	--	
L-8	1800	310	24	13	3	5	2664	1.3	38	--	30' - 54"	
L-8	5800	1010	66	14	4	5	9686	4.7	41	--	40' - 60"	
L-8	3600	1226	78	15	5	5	6660	3.1	44	--	15' C.T. Br.	
L-8	800	1242	79	15	5	5	1480	0.7	44	--	--	
L-9	1900	210	18	13	3	5	2812	1.4	38	--	--	
L-9	1700	480	35	13	3	5	2516	1.2	38	--	--	
L-9	5400	1140	73	14	4	5	9018	4.3	41	--	15' C.T. Br.	
L-9	1300	1204	76	15	5	5	2405	1.1	44	--	--	
L-10	2500	108	10	13	3	5	3700	1.8	38	--	--	
L-11	2900	160	14	13	3	5	4292	2.1	38	--	--	
L-12	1200	80	8	13	3	5	1776	0.9	38	--	--	
L-12	3500	552	40	13	3	5	5180	2.6	38	--	--	
L-12	6200	1234	78	15	5	5	11,470	5.4	44	--	15' C.T. Br.	
L-12	1900	1306	82	15	5	5	3515	1.7	44	--	--	
L-13	3900	320	25	13	3	5	5772	2.9	38	--	--	
L-14	4500	150	13	13	3	5	6660	3.3	38	--	--	
L-15	2100	80	8	13	3	5	3108	1.5	38	--	--	
L-15	4200	556	40	13	3	5	6216	3.1	38	--	15' C.T. Br.	
L-15	1200	588	42	13	3	5	1776	0.9	38	--	--	
L-16	3100	156	13	13	3	5	4588	2.3	38	--	--	
L-17	500	56	6	13	3	5	740	0.4	38	--	30' - 30"	
L-17	2600	276	22	13	3	5	3848	1.9	38	--	--	
L-17	2700	720	50	13	3	5	3996	2.0	38	--	15' U.T. Br.	
L-17	4400	984	65	13	3	5	6512	3.2	38	--	15' U.T. Br.	
L-17	1500	1164	75	13	3	5	2220	1.1	38	--	--	
L-17	2900	2632	146	16	6	5	5916	2.7	46	--	15' U.T. Br.	
L-17	1500	2728	151	16	6	5	3060	1.4	46	--	--	
L-17	3300	2932	160	17	7	5	7326	3.3	49	--	--	
L-17	4100	4120	213	20	10	5	11,398	4.8	57	--	30' U.T. Br.	

ENGINEERING AND DESIGN DATA

Area 7 - St. Stephen - Alvin - Jamestown

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-18	3700	300	24	13	3	5	5476	2.7	38	--	--	
L-19	2000	60	6	13	3	5	2960	1.5	38	--	30' - 30"	
L-20	5300	800	54	13	3	5	7844	3.9	38	--	15' U.T. Br.	
L-20	1300	1280	80	13	3	5	1924	1.0	38	--	15' R.C. Br.	
L-20	700	1288	80	13	3	5	1036	0.5	38	--	--	
L-21	4200	364	28	13	3	5	6216	3.1	38	--	30' - 54"	
L-21	1500	416	31	13	3	5	2220	1.1	38	--	--	
L-22	2400	46	5	13	3	5	3552	1.8	38	--	--	
L-23	600	160	14	13	3	5	888	0.4	38	--	30' - 36"	
L-23	3500	564	40	13	3	5	5180	2.6	38	--	40' - 24"	
L-23	4100	818	55	13	3	5	6068	3.0	38	--	--	
Total-7	196,400						424,165	189.0				141,908.00
M-8	2900	254	21	13	3	5	4292	2.1	38	--	40' - 42"	
M-8	2700	362	27	13	3	5	3996	2.0	38	--	--	
M-8	2400	1424	88	18	8	5	5784	2.5	52	--	--	
M-8	3800	1764	105	19	9	5	9842	4.3	55	--	--	
M-8	5500	5256	263	28	18	5	23,430	9.1	78	--	--	
M-8	600	8516	392	38	28	5	3666	1.4	105	--	--	
M-8	3200	8728	399	32	22	5	16,000	6.1	89	--	--	
M-8	1300	10,326	460	42	32	5	8905	3.3	116	--	--	
M-8	4300	11,882	520	40	30	5	27,864	10.3	110	--	--	
M-8	5500	13,454	568	42	32	5	37,675	13.9	116	--	--	
L-1	4000	360	27	13	3	5	5920	2.9	38	--	--	
L-2	5600	492	36	13	3	5	8288	4.1	38	--	--	
L-3	5800	336	27	13	3	5	8584	4.3	38	50' - 24"	50' - 42" 30' - 36"	
L-3	7000	1188	75	16	6	5	14,280	6.4	46	--	--	
L-3	3900	1500	91	18	8	5	9399	4.1	51	--	--	
L-3	2000	1668	100	19	9	5	5180	2.2	55	--	--	
L-3	4800	3076	168	26	16	5	18,672	7.4	73	--	--	
L-4	3000	648	45	14	4	5	5010	2.4	41	--	15' U.T. Br.	
L-4	4100	1008	66	16	6	5	8364	3.8	46	--	--	
L-5	6600	592	42	13	3	5	9768	4.8	38	--	15' C.T. Br.	
L-5	5800	1016	66	16	6	5	11,832	5.3	46	--	15' C.T. Br.	
L-5	4600	1668	100	19	9	5	11,914	5.2	55	--	--	
L-5	5900	2720	151	24	14	5	20,768	8.4	68	--	15' C.T. Br.	
L-5	5000	3120	171	26	16	5	19,450	7.7	73	--	30' C.T. Br.	
L-6	3200	292	23	13	3	5	4736	2.4	38	--	--	
L-7	3500	440	33	13	3	5	5180	2.6	38	--	30' - 60"	
L-7	4300	848	57	13	3	5	6364	3.2	38	--	15' R.C. Br.	
L-7	4200	1298	81	15	5	5	7770	3.7	44	--	3-15' U.T. Brs	
L-7	1700	1458	90	16	6	5	3468	1.6	46	--	--	
L-8	5000	480	35	13	3	5	7400	3.7	38	--	--	
L-8	3200	1168	75	15	5	5	5920	2.8	44	--	--	
L-8	2500	1288	80	15	5	5	4625	2.2	44	--	--	
L-9	1700	340	27	13	3	5	2516	1.2	38	--	--	
L-10	1700	120	11	13	3	5	2516	1.2	38	--	--	

ENGINEERING AND DESIGN DATA

Area 7 - St. Stephen - Alvin - Jamestown

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-11	3600	240	20	13	3	5	5328	2.6	38	--	40' - 42"	
L-11	1700	332	26	13	3	5	2516	1.2	38	--	--	
L-11	5800	1012	66	14	4	5	9686	4.7	41	--	--	
L-12	2200	100	10	13	3	5	3256	1.6	38	--	--	
Total-8	144,600						370,164	158.7				116,167.00
M-9	2200	292	23	13	3	5	3256	1.6	38	--	--	
M-9	1400	572	41	13	3	5	2072	1.0	38	--	--	
M-9	2300	1124	72	13	3	5	3404	1.7	38	--	--	
M-9	3300	1632	98	15	5	5	6105	2.9	44	--	--	
M-9	3300	2400	135	17	7	5	7326	3.3	49	--	--	
L-1	2500	208	18	13	3	5	3700	1.8	38	--	--	
L-2	3600	432	33	13	3	5	5328	2.6	38	--	40' - 24"	
L-3	3400	348	27	13	3	5	5032	2.5	38	--	30' - 36"	
L-4	7100	560	40	13	3	5	10,508	5.2	38	--	30' - 54"	
Total-9	29,100						46,731	22.6				15,283.00
M-10			Present canal as constructed is considered adequate									
Area 7 Grand Total	432,800						936,793	417.3				308,554.00

ENGINEERING AND DESIGN DATA

Area 8 - Russellville - Bonneau - Macedonia

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	BOTTOM WIDTH Ft. (6)	AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1	1700	90	9	13	3	5	2516	1.2	38	80' - 24"	--	
M-1	7400	234	19	13	3	5	10,952	5.4	38	--	--	
M-1	1900	718	49	13	3	5	2812	1.4	38	--	40' - 54"	
M-1	700	730	50	13	3	5	1036	0.5	38	--	--	
M-1	6000	1422	88	16	6	5	12,240	5.5	46	--	--	
M-1	2200	2142	124	18	8	5	5302	2.3	52	--	--	
M-1	3000	3310	178	22	12	5	9450	3.9	62	--	--	
M-1	600	3324	179	22	12	5	1890	0.8	62	--	--	
M-1	2400	4524	230	26	16	5	9336	3.7	73	--	--	
M-1	2800	4804	240	26	16	5	10,892	4.3	73	--	--	
M-1	5100	6898	329	32	22	5	25,500	9.7	89	--	--	
M-1	2000	6968	332	32	22	5	10,000	3.8	89	--	--	
M-1	5200	12,264	512	45	35	5	38,480	14.1	124	--	--	
M-1	1800	12,336	530	45	35	5	13,320	4.9	124	--	--	
M-1	2600	15,874	657	55	45	5	24,076	8.6	150	--	--	
M-1	2200	20,322	809	70	60	5	26,488	9.3	190	--	--	
M-1	2900	24,984	956	70	60	5	34,916	12.2	190	--	75' R.C. Br.	
M-1	4300	25,500	976	70	60	5	51,772	18.2	190	--	--	
M-1	1000	25,700	984	70	60	5	12,040	4.2	190	--	--	
M-1	3300	26,748	1024	70	60	5	39,732	13.9	190	--	--	
M-1	4200	27,784	1042	70	60	5	50,568	17.7	190	--	--	
M-1	3300	34,628	1272	90	80	5	51,942	18.0	244	--	--	
M-1	4800	35,774	1287	90	80	5	75,552	26.2	244	--	--	
L-1	1500	78	9	13	3	5	2220	1.1	38	40' - 24"	40' - 24"	
L-1	4500	340	26	13	3	5	6660	3.3	38	--	30' - 36"	
L-2	1900	132	12	13	3	5	2812	1.4	38	--	--	
L-2	2000	258	21	13	3	5	2960	1.5	38	--	--	
L-3	2000	60	6	13	3	5	2960	1.5	38	--	--	
L-4	3700	166	14	13	3	5	5476	2.7	38	--	40' - 36"	
L-4	700	176	15	13	3	5	1036	0.5	38	--	--	
L-4	2000	652	46	13	3	5	2960	1.5	38	--	15' U.T. Br. 15' U.T. Br.	
L-5	3700	364	28	13	3	5	5476	2.7	38	--	40' - 48"	
L-5	1500	420	32	13	3	5	2220	1.1	38	--	--	
L-6	3100	376	29	13	3	5	4588	2.3	38	--	30' - 54"	
L-6	5100	884	59	13	3	5	7548	3.7	38	--	--	
L-7	2400	96	9	13	3	5	3552	1.8	38	--	--	
L-7	1300	428	32	13	3	5	1924	1.0	38	--	15' U.T. Br.	
L-7	3800	1044	68	14	4	5	6346	3.1	41	--	--	
L-8		296	Present canal as constructed is considered adequate									
L-9	3000	312	25	13	3	5	4440	2.2	38	--	30' - 48" 30' - 48"	
L-9	3200	460	34	13	3	5	4736	2.4	38	--	50' - 24"	
L-9	1400	488	36	13	3	5	2072	1.0	38	--	--	
L-10	2600	152	13	13	3	5	3848	1.9	38	--	20' - 18"	
L-11	4200	414	31	13	3	5	6216	3.1	38	--	40' - 54"	
L-11	5400	646	45	13	3	5	7992	4.0	38	--	--	
L-11	500	806	54	13	3	5	740	0.4	38	--	15' U.T. Br.	

ENGINEERING AND DESIGN DATA

Area 8 - Russellville - Bonneau - Macedonia

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-11	1800	1002	66	14	4	5	3006	1.4	41	--	--	
L-11	3200	1344	84	15	5	5	5920	2.8	44	--	--	
L-12	2700	102	10	13	3	5	3996	2.0	38	--	--	
L-13	2900	84	8	13	3	5	4292	2.1	38	--	--	
L-14	4200	238	19	13	3	5	6216	3.1	38	--	30' - 42"	
L-15	3000	118	11	13	3	5	4440	2.2	38	--	--	
L-16	3000	776	53	13	3	5	4440	2.2	38	80' - 48"	40' - 30"	
L-16	1700	860	58	13	3	5	2516	1.2	38	--	--	
L-16	7300	2552	144	17	7	5	16,206	7.2	49	--	--	
L-16	2500	3448	183	19	9	5	6475	2.8	55	--	--	
L-16	2800	4736	237	22	12	5	8820	3.6	62	--	--	
L-17		254	Present canal as constructed is considered adequate									
L-17	6700	1322	83	14	4	5	11,189	5.4	41	--	15' U.T. Br.	
L-18	1900	146	13	13	3	5	2812	1.4	38	40' - 36"	--	
L-18	5000	340	27	13	3	5	7400	3.7	38	--	--	
L-18	2600	780	53	13	3	5	3848	1.9	38	--	--	
L-19	3500	224	19	13	3	5	5180	2.6	38	--	--	
L-19	900	342	27	13	3	5	1332	0.7	38	--	--	
L-20	2000	96	9	13	3	5	2960	1.5	38	--	--	
L-21	1800	148	13	13	3	5	2664	1.3	38	--	--	
L-21	3700	560	40	13	3	5	5476	2.7	38	--	--	
L-22	1300	50	5	13	3	5	1924	1.0	38	--	20' - 24"	
L-22	1300	118	11	13	3	5	1924	1.0	38	--	--	
L-22	2000	446	33	13	3	5	2960	1.5	38	--	15' U.T. Br.	
L-22	4000	608	43	13	3	5	5920	2.9	38	--	--	
L-23	2300	100	10	13	3	5	3404	1.7	38	--	--	
L-24	3300	610	43	13	3	5	4884	2.4	38	--	--	
L-24	700	720	50	13	3	5	1036	0.5	38	--	--	
L-24	300	1034	67	14	4	5	501	0.2	41	--	40' - 36"	
L-24	700	1074	69	14	4	5	1169	0.6	41	--	--	
L-24	8600	2234	129	18	8	5	20,726	9.1	52	--	--	
L-24	1900	2310	132	18	8	5	4579	2.0	52	--	--	
L-25	1200	100	10	13	3	5	1776	0.9	38	--	--	
L-26	3900	250	20	13	3	5	5772	2.9	38	--	30' - 48"	
L-26	1600	274	22	13	3	5	2368	1.2	38	--	--	
L-27	9000	976	64	14	4	5	15,030	7.2	41	--	40' - 60"	
L-27	3500	1106	71	14	4	5	5845	2.8	41	--	--	
L-28	9900	570	41	13	3	5	14,652	7.3	38	--	--	
L-28	1400	730	50	13	3	5	2072	1.0	38	--	--	
L-28	2700	1384	86	15	5	5	4995	2.4	44	--	15' R.C. Br.	
L-28	800	1416	87	16	6	5	1632	0.7	46	--	--	
L-28	2900	1652	99	16	6	5	5916	2.7	46	--	--	
L-28	900	1768	105	16	6	5	1836	0.8	46	--	40' - 36"	
L-28	1100	1920	113	17	7	5	2442	1.1	49	--	--	
L-28	1300	2052	119	17	7	5	2886	1.3	49	--	--	
L-28	1800	2430	137	19	9	5	4662	2.0	55	--	15' R.C. Br.	
L-28	2200	2492	140	19	9	5	5698	2.5	55	--	--	
L-28	5100	4348	224	26	16	5	19,839	7.8	73	--	--	

ENGINEERING AND DESIGN DATA

Area 8 - Russellville - Bonneau - Macedonia

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-29	2600	78	8	13	3	5	3848	1.9	38	--	--	
L-30	4200	490	36	13	3	5	6216	3.1	38	--	--	
L-31	2000	152	13	13	3	5	2960	1.5	38	--	--	
L-32	1700	40	4	13	3	5	2516	1.2	38	--	--	
L-33	1400	96	9	13	3	5	2072	1.0	38	--	--	
L-34	3900	172	15	13	3	5	5772	2.9	38	--	--	
L-35	1600	488	36	13	3	5	2368	1.2	38	--	40' - 54"	
L-35	5300	1188	75	14	4	5	8851	4.3	41	--	15' R.C. Br.	
L-35	3500	1508	92	16	6	5	7140	3.2	46	--	--	
L-36	1300	268	24	13	3	5	1924	1.0	38	80' - 36"	--	
L-36	6900	1544	94	16	6	5	14,076	6.3	46	--	--	
L-36	5100	2076	120	17	7	5	11,322	5.0	49	--	30' C.T. Br.	
L-36	3300	2696	149	19	9	5	8547	3.7	55	--	30' C.T. Br.	
L-36	3500	2932	160	20	10	5	9730	4.1	57	--	--	
L-36	7400	3746	196	24	14	5	26,048	10.5	68	--	--	
L-36	3100	4122	213	24	14	5	10,912	4.4	68	--	--	
L-37	2300	86	8	13	3	5	3404	1.7	38	--	--	
L-38	2600	156	13	13	3	5	3848	1.9	38	--	--	
L-39	2900	384	29	13	3	5	4292	2.1	38	--	30' - 54"	
L-39	1700	764	52	13	3	5	2516	1.2	38	--	--	
L-40	2800	344	27	13	3	5	4144	2.1	38	--	30' - 48"	
L-41	2200	178	15	13	3	5	3256	1.6	38	--	40' - 30"	
L-41	300	208	18	13	3	5	444	0.2	38	--	30' - 48"	
L-41	2800	568	41	13	3	5	4144	2.1	38	--	15' U.T. Br.	
L-41	2200	656	46	13	3	5	3256	1.6	38	--	--	
L-42	7700	976	64	14	4	5	12,859	6.2	41	--	--	
L-42	2700	2544	148	19	9	5	6993	3.0	55	--	30' U.T. Br.	
L-42	2400	3048	167	22	12	5	7560	3.1	62	--	30' R.C. Br.	
L-42	1000	3090	167	22	12	5	3150	1.3	62	--	--	
L-42	900	3878	203	24	14	5	3168	1.3	68	--	--	
L-42	4100	4596	233	26	16	5	15,949	6.3	73	--	15' R.C. Br.	
L-42	2700	4700	239	26	16	5	10,503	4.2	73	--	--	
L-42	1400	6396	310	32	22	5	7000	2.7	89	--	--	
L-43	5500	448	33	13	3	5	8140	4.0	38	--	--	
L-44	7400	860	58	13	3	5	10,952	5.5	38	--	--	
L-45	2300	164	14	13	3	5	3404	1.7	38	--	--	
L-45	400	432	33	13	3	5	592	0.3	38	--	40' - 42"	
L-45	1600	532	38	13	3	5	2368	1.2	38	--	--	
L-45	2100	672	47	13	3	5	3108	1.5	38	--	15' R.C. Br.	
L-45	1800	732	50	13	3	5	2664	1.3	38	--	15' U.T. Br.	
L-45	1300	752	52	13	3	5	1924	1.0	38	--	--	
L-46	4300	256	21	13	3	5	6364	3.2	38	--	--	
L-47	3000	82	8	13	3	5	4440	2.2	38	--	--	
L-48	4600	836	56	13	3	5	6808	3.4	38	--	15' R.C. Br.	
L-48	2600	1144	73	14	4	5	4342	2.1	41	--	15' U.T. Br.	
L-48	3200	1584	97	16	6	5	6528	2.9	46	--	--	
L-48	500	1664	100	16	6	5	1020	0.5	46	--	--	
L-48	2300	1820	108	16	6	5	4692	2.1	46	--	--	

ENGINEERING AND DESIGN DATA

Area 8 - Russellville - Bonneau - Macedonia

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-49	1400	160	14	13	3	5	2072	1.0	38	--	40' - 30"	
L-49	4000	388	30	13	3	5	5920	2.9	38	--	40' - 48"	
L-49	3600	766	53	13	3	5	5328	2.6	38	--	--	
Total-1	421,200						1,166,684	490.6				376,446.00
M-2	7800	540	39	13	3	5	11,544	5.7	38	--	60' - 48" 15' U.T. Br. 15' R.C. Br.	
M-2		1544	Present canal as constructed is considered adequate							--	--	
M-2		1644	Present canal as constructed is considered adequate							--	15' R.C. Br.	
M-2		1702	Present canal as constructed is considered adequate							--	--	
M-2	2600	2986	163	22	12	5	8190	3.3	62	--	--	
M-2	1400	3282	177	22	12	5	4410	1.8	62	--	--	
M-2	1000	3398	181	22	12	5	3150	1.3	62	--	--	
M-2	3300	4388	227	26	16	5	12,837	5.1	73	--	--	
M-2	2300	4776	239	26	16	5	8947	3.5	73	--	--	
M-2	1100	5444	268	28	18	5	4686	1.8	78	--	--	
M-2	1700	5728	282	30	20	5	7871	3.0	84	--	--	
M-2	1800	6038	292	30	20	5	8334	3.2	84	--	--	
M-2	1900	6132	297	30	20	5	8797	3.4	84	--	--	
M-2	2400	6656	322	32	22	5	12,000	4.6	89	--	--	
M-2	2100	6860	327	32	22	5	10,500	4.0	89	--	--	
M-2	4700	7256	353	34	24	5	25,239	9.5	94	--	--	
L-1	1700	140	13	13	3	5	2516	1.2	38	--	40' - 24"	
L-1	5200	546	39	13	3	5	7696	3.8	38	--	15' C.T. Br.	
L-1	5000	1140	73	14	4	5	8350	4.0	41	--	--	
L-2	2100	144	13	13	3	5	3108	1.5	38	--	50' - 30"	
L-2	2400	234	19	13	3	5	3552	1.8	38	--	--	
L-3	3700	432	33	13	3	5	5476	2.7	38	--	40' - 54"	
L-3	2900	710	49	13	3	5	4292	2.1	38	--	--	
L-4	4000	176	15	13	3	5	5920	2.9	38	--	50' - 30"	
L-4	3700	296	23	13	3	5	5476	2.7	38	--	--	
L-5	3500	236	19	13	3	5	5180	2.6	38	--	--	
L-6	2900	100	10	13	3	5	4292	2.1	38	--	--	
L-7	1200	58	6	13	3	5	1776	0.9	38	50' - 30"	--	
L-7	5700	252	20	13	3	5	8436	4.2	38	--	--	
L-8	1500	110	10	13	3	5	2220	1.1	38	--	--	
L-8	1600	286	23	13	3	5	2368	1.2	38	--	30' - 48"	
L-8	500	394	30	13	3	5	740	0.4	38	--	40' - 42"	
L-8	1300	422	32	13	3	5	1924	1.0	38	--	--	
L-9	1500	78	8	13	3	5	2220	1.1	38	--	--	
L-10	3000	86	8	13	3	5	4440	2.2	38	--	--	
L-11	2400	98	9	13	3	5	3552	1.8	38	--	--	
L-12	1700	156	13	13	3	5	2516	1.2	38	--	40' - 30"	
L-12	2700	202	17	13	3	5	3996	2.0	38	--	--	
Total-2	94,300						216,551	94.7				71,959.00

ENGINEERING AND DESIGN DATA

Area 8 - Russellville - Bonneau - Macedonia

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-3	1800	176	15	13	3	5	2664	1.3	38	--	--	
M-3	3800	312	25	13	3	5	5624	2.8	38	40' - 60"	--	
M-3	3700	540	39	13	3	5	5476	2.7	38	--	80' - 54"	
M-3	2800	610	43	13	3	5	4144	2.1	38	--	260' - 48"	
Total-3	12,100						17,908	8.9				13,22?.00
M-4	2000	90	9	13	3	5	2960	1.5	38	--	--	
M-4	3800	216	18	13	3	5	5624	2.8	38	--	60' - 30"	
M-4	2100	290	23	13	3	5	3108	1.5	38	--	--	
Total-4	7900						11,692	5.8				4110.00
M-5	1000	120	11	13	3	5	1480	0.7	38	--	--	
M-5	2100	180	16	13	3	5	3108	1.5	38	--	--	
M-5	2300	432	33	13	3	5	3404	1.7	38	--	--	
L-1	2400	136	12	13	3	5	3552	1.8	38	--	--	
Total-5	7800						11,544	5.7				3449.00
Area 8 Grand Total	543,300						1,424,379	605.7				469,186.00

ENGINEERING AND DESIGN DATA

Area 9 - Macedonia - Bethera - Gough

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1	4000	250	20	13	3	5	5920	2.9	38	--	--	
M-1	700	794	54	13	3	5	1036	0.5	38	--	15' C.T. Br.	
M-1	2200	894	60	13	3	5	3256	1.6	38	--	--	
M-1	4400	1346	84	15	5	5	8140	3.8	44	--	--	
M-1	4700	1902	113	18	8	5	11,327	5.0	52	--	15' C.T. Br.	
M-1	3000	2042	118	18	8	5	7230	3.2	52	--	--	
M-1	4100	4322	223	28	18	5	17,466	6.8	78	--	--	
M-1	1000	4472	231	28	18	5	4260	1.7	78	--	--	
M-1	4600	5874	285	32	22	5	23,000	8.8	89	--	--	
M-1	4500	6184	299	34	24	5	24,165	9.1	94	--	--	
M-1	2300	8566	388	40	30	5	14,904	5.5	110	--	--	
M-1	3700	11,202	490	50	40	5	30,821	11.1	137	--	--	
M-1	7800	12,062	518	45	35	5	57,720	21.1	124	--	--	
M-1	4400	12,554	539	50	40	5	36,652	13.2	137	--	--	
M-1	3600	15,248	631	55	45	5	33,336	11.9	150	--	--	
L-1	6600	504	37	13	3	5	9768	4.8	38	--	--	
L-2	2500	90	9	13	3	5	3700	1.8	38	--	--	
L-3	1600	116	11	13	3	5	2368	1.2	38	40' - 48"	--	
L-3	5000	492	36	13	3	5	7400	3.7	38	--	15' C.T. Br.	
L-3	4500	682	48	13	3	5	6660	3.3	38	--	--	
L-3	2200	1792	106	16	6	5	4488	2.0	46	--	--	
L-4	7800	380	29	13	3	5	11,544	5.7	38	--	30' - 54"	
L-4	4200	900	60	13	3	5	6216	3.1	38	--	--	
L-5	3000	130	12	13	3	5	4440	2.2	38	--	--	
L-6	6600	900	60	13	3	5	9768	4.8	38	--	15' C.T. Br.	
L-6	2700	1006	66	14	4	5	4509	2.2	41	--	--	
L-7	6800	426	32	13	3	5	10,064	5.0	38	--	30' - 60"	
L-7	700	436	33	13	3	5	1036	0.5	38	--	--	
L-7	2700	2252	128	18	8	5	6507	2.9	52	--	--	
L-8	5800	920	61	13	3	5	8584	4.3	38	--	--	
L-8	4500	1448	88	16	6	5	9180	4.1	46	--	15' C.T. Br.	
L-8	1000	1632	98	16	6	5	2040	0.9	46	--	--	
L-9	2400	358	27	13	3	5	3552	1.8	38	--	--	
L-9	3600	730	50	13	3	5	5328	2.6	38	--	15' C.T. Br.	
L-9	3800	956	67	14	4	5	6346	3.1	41	--	--	
L-10	2200	112	11	13	3	5	3256	1.6	38	--	--	
L-11	9200	1106	71	14	4	5	15,364	7.4	41	--	--	
L-12	7000	750	51	13	3	5	10,360	5.1	38	--	--	
L-12	3700	1872	111	17	7	5	8214	3.7	49	--	15' R.C. Br.	
L-12	1000	1912	112	17	7	5	2220	1.0	49	--	--	
L-12	5500	2514	141	19	9	5	14,245	6.2	55	--	--	
L-13	4600	252	20	13	3	5	6808	3.4	38	--	--	
L-13	1900	910	60	13	3	5	2812	1.4	38	--	--	
L-14	6300	582	41	13	3	5	9324	4.6	38	--	--	
L-15	3400	194	16	13	3	5	5032	2.5	38	--	40' - 42"	
L-15	1700	242	20	13	3	5	2516	1.2	38	--	--	
Total-1	179,500						482,882	204.3				145,415.00

ENGINEERING AND DESIGN DATA

Area 9 - Macedonia - Bethera - Gough

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-2	4700	464	34	13	3	5	6956	3.5	38	--	--	
M-2	4600	986	65	14	4	5	7682	3.7	41	120' - 48"	--	
M-2	1800	1146	73	14	4	5	3006	1.4	41	--	--	
M-2	4400	3278	177	22	12	5	13,860	5.7	62	--	--	
M-2	4300	5096	255	28	18	5	18,318	7.1	78	--	--	
M-2	2000	5276	260	28	18	5	8520	3.3	78	--	--	
M-2	3700	7316	343	34	24	5	19,869	7.5	94	--	--	
M-2	700	8238	380	36	26	5	4018	1.5	99	--	--	
M-2	6100	8862	402	38	28	5	37,271	13.9	105	--	--	
M-2	2100	9298	421	40	30	5	13,608	5.0	110	--	--	
M-2	200	9598	435	40	30	5	1296	0.5	110	--	--	
M-2	6200	10,018	446	40	30	5	40,176	14.8	110	--	--	
L-1	5700	594	42	13	3	5	8436	4.2	38	--	15' C.T. Br.	
L-1	5300	1362	85	16	6	5	10,812	4.9	46	--	--	
L-1	3200	1728	103	16	6	5	6528	2.9	46	--	--	
L-2	2200	420	32	13	3	5	3256	1.6	38	--	30' - 60"	
L-2	2000	508	37	13	3	5	2960	1.5	38	--	30' - 54"	
L-3	2600	126	12	13	3	5	3848	1.9	38	--	--	
L-4	6400	480	35	13	3	5	9472	4.7	38	--	15' C.T. Br.	
L-4	3900	668	47	13	3	5	5772	2.9	38	--	15' C.T. Br.	
L-4	4900	1028	67	14	4	5	8183	3.9	41	--	--	
L-4	5000	1238	78	15	5	5	9250	4.4	44	--	--	
L-5	3900	422	32	13	3	5	5772	2.9	38	--	30' - 60"	
L-5	2500	626	44	13	3	5	3700	1.8	38	--	15' C.T. Br.	
L-5	6200	1220	77	15	5	5	11,470	5.4	44	--	--	
L-5	4000	1444	88	16	6	5	8160	3.7	46	--	15' C.T. Br.	
L-5	1600	1484	90	16	6	5	3264	1.5	46	--	--	
L-5	1900	1628	99	16	6	5	3876	1.7	46	--	--	
L-6	1600	58	6	13	3	5	2368	1.2	38	--	30' - 24"	
L-6	600	88	9	13	3	5	888	0.4	38	--	--	
L-7	4400	280	22	13	3	5	6512	3.2	38	--	--	
L-7	4200	610	43	13	3	5	6216	3.1	38	--	--	
L-7	1600	890	59	13	3	5	2368	1.2	38	--	15' C.T. Br.	
L-7	700	908	60	13	3	5	1036	0.5	38	--	--	
L-8	1100	74	8	13	3	5	1628	0.8	38	--	--	
L-9	4500	240	20	13	3	5	6660	3.3	38	--	--	
L-10	2000	148	13	13	3	5	2960	1.5	38	--	30' - 36"	
L-10	1000	164	14	13	3	5	1480	0.7	38	--	--	
L-11	1400	144	13	13	3	5	2072	1.0	38	--	30' - 36"	
L-11	2300	288	23	13	3	5	3404	1.7	38	--	30' - 48"	
L-11	1500	332	26	13	3	5	2220	1.1	38	--	--	
L-12	4800	296	23	13	3	5	7104	3.5	38	--	--	
Total-2	133,800						326,255	141.0				103,303.00
M-3	6400	328	25	13	3	5	9472	4.7	38	40' - 36" 40' - 24"	40' - 30"	
M-3	5200	628	44	13	3	5	7696	3.8	38	--	--	
M-3	2800	722	50	13	3	5	4144	2.1	38	--	--	
M-3	2400	1126	72	14	4	5	4008	1.9	41	--	--	

ENGINEERING AND DESIGN DATA

Area 9 - Macedonia - Bethera - Gough

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-1	3800	248	20	13	3	5	5624	2.8	38	--	--	
L-1	1500	304	24	13	3	5	2220	1.1	38	--	--	
Total-3	22,100						33,164	16.4				10,747.00
M-4	4800	252	20	13	3	5	7104	3.5	38	--	--	
M-4	1000	328	25	13	3	5	1480	0.7	38	--	--	
M-4	500	388	30	13	3	5	740	0.4	38	--	30' - 54"	
M-4	1000	418	31	13	3	5	1480	0.7	38	40' - 30"	40' - 48"	
M-4	1400	452	34	13	3	5	2072	1.0	38	--	--	
M-4	3600	796	54	13	3	5	5328	2.6	38	--	--	
L-1	1000	36	5	13	3	5	1480	0.7	38	--	--	
L-2	2000	50	6	13	3	5	2960	1.5	38	--	--	
L-3	2000	104	10	13	3	5	2960	1.5	38	--	40' - 30"	
L-3	1300	134	12	13	3	5	1924	1.0	38	--	--	
Total-4	18,600						27,528	13.6				10,375.00
M-5	8300	524	38	13	3	5	12,284	6.1	38	--	15' C.T. Br.	
M-5	3000	754	52	13	3	5	4440	2.2	38	--	--	
M-5	5000	1418	88	16	6	5	10,200	4.6	46	--	--	
M-5	1600	1766	105	16	6	5	3264	1.5	46	--	--	
M-5	1400	1856	110	17	7	5	3108	1.4	49	--	--	
M-5	1100	4516	229	26	16	5	4279	1.7	73	--	--	
M-5	1200	5532	272	28	18	5	5112	2.0	78	--	30' C.T. Br.	
M-5	5800	6062	294	30	20	5	26,854	10.4	84	--	--	
M-5	4200	6428	311	32	22	5	21,000	8.0	89	--	--	
L-1	3500	204	17	13	3	5	5180	2.6	38	--	--	
L-2	1100	48	6	13	3	5	1628	0.8	38	--	30' - 30"	
L-2	3200	228	19	13	3	5	4736	2.4	38	--	--	
L-3	1700	248	20	13	3	5	2516	1.2	38	40' - 36"	40' - 36"	
L-3	1500	296	23	13	3	5	2220	1.1	38	--	--	
L-3	3800	1016	67	14	4	5	6346	3.1	41	--	--	
L-3	3100	1458	89	16	6	5	6324	2.8	46	--	--	
L-3	1200	2508	141	19	9	5	3108	1.3	55	--	--	
L-3	2400	2592	146	19	9	5	6216	2.7	55	--	--	
L-4	4600	540	39	13	3	5	6808	3.4	38	--	--	
L-5	500	66	7	13	3	5	740	0.4	38	--	30' - 30"	
L-5	1700	118	11	13	3	5	2516	1.2	38	40' - 24"	40' - 30"	
L-5	3900	318	25	13	3	5	5772	2.9	38	--	--	
L-6	9400	1000	66	14	4	5	15,698	7.6	41	--	--	
L-7	2300	172	15	13	3	5	3404	1.7	38	--	30' - 42"	
L-7	600	302	24	13	3	5	888	0.4	38	--	40' - 30"	
L-7	900	402	30	13	3	5	1332	0.7	38	--	--	
L-7	1800	628	44	13	3	5	2664	1.3	38	--	15' C.T. Br.	
L-7	1700	708	49	13	3	5	2516	1.2	38	--	--	
L-7	700	882	59	13	3	5	1036	0.5	38	--	--	
L-7	1500	944	62	14	4	5	2505	1.2	41	--	--	
L-8	1900	80	8	13	3	5	2812	1.4	38	--	--	
L-9	3600	150	13	13	3	5	5328	2.6	38	--	--	
L-10	3800	116	11	13	3	5	5624	2.8	38	--	30' - 30"	
Total-5	92,000						188,458	85.2				60,956.00

ENGINEERING AND DESIGN DATA

Area 9 - Macedonia - Bethera - Gough

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-6	3100	134	12	13	3	5	4588	2.3	38	--	30' - 30"	
M-6	1100	174	15	13	3	5	1628	0.8	38	--	--	
M-6	1700	234	19	13	3	5	2516	1.2	38	--	--	
M-6	800	308	24	13	3	5	1184	0.6	38	--	--	
M-6	3500	492	36	13	3	5	5180	2.6	38	--	--	
L-1	2100	44	6	13	3	5	3108	1.5	38	--	40' - 18"	
L-1	500	50	7	13	3	5	740	0.4	38	--	--	
L-2	800	24	3	13	3	5	1184	0.6	38	40' - 18"	--	
L-2	1300	60	6	13	3	5	1924	1.0	38	--	--	
Total-6	14,900						22,052	11.0				7192.00
Area 9 Grand Total	460,900						1,080,339	471.4				337,988.00

ENGINEERING AND DESIGN DATA

Area 10 - Childsbury - Cordesville - Witherbee

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1	4900	300	24	13	3	5	7252	3.6	38	--	--	
M-1	800	720	50	13	3	5	1184	0.6	38	--	--	
M-1	1000	892	60	13	3	5	1480	0.7	38	--	--	
M-1	2500	1006	66	13	3	5	3700	1.8	38	--	--	
L-1	3200	184	16	13	3	5	4736	2.4	38	--	30' - 36"	
L-1	1000	314	25	13	3	5	1480	0.7	38	--	--	
L-2	3400	120	11	13	3	5	5032	2.5	38	--	--	
L-3	3400	94	9	13	3	5	5032	2.5	38	--	30' - 36"	
L-3	200	98	9	13	3	5	296	0.1	38	--	--	
L-4	1900	80	8	13	3	5	2812	1.4	38	--	30' - 18"	
L-4	500	114	11	13	3	5	740	0.4	38	--	--	
L-5	1300	24	3	13	3	5	1924	1.0	38	--	--	
Total-1	24,100						35,668	17.7				11,652.00
M-2	800	48	6	13	3	5	1184	0.6	38	40' - 24"	--	
M-2	2300	160	14	13	3	5	3404	1.7	38	--	30' - 30"	
M-2	1600	240	20	13	3	5	2368	1.2	38	--	40' - 24"	
M-2	1000	324	25	13	3	5	1480	0.7	38	--	--	
M-2	4600	644	45	13	3	5	6808	3.4	38	--	--	
L-1	2200	96	9	13	3	5	3256	1.6	38	--	--	
Total-2	12,500						18,500	9.2				6430.00
M-3	3100	326	25	13	3	5	4588	2.3	38	--	--	
M-3	3800	616	44	13	3	5	5624	2.8	38	--	--	
M-3	3400	988	65	13	3	5	5032	2.5	38	--	--	
M-3	3400	1268	79	13	3	5	5032	2.5	38	--	--	
M-3	300	1736	103	14	4	5	501	0.2	44	--	15' U.T. Br.	
M-3	1300	1768	105	15	5	5	2405	1.1	44	--	--	
L-1	1800	70	7	13	3	5	2664	1.3	38	--	--	
L-2	4000	120	11	13	3	5	5920	2.9	38	--	--	
L-3	3000	144	13	13	3	5	4440	2.2	38	--	--	
L-4	4200	218	18	13	3	5	6216	3.1	38	--	--	
L-4	600	458	34	13	3	5	888	0.4	38	--	--	
L-5	1100	58	6	13	3	5	1628	0.8	38	--	40' - 24"	
L-5	1600	100	10	13	3	5	2368	1.2	38	--	--	
Total-3	31,600						47,306	23.3				14,913.00
M-4	2600	164	14	13	3	5	3848	1.9	38	--	--	
M-4	1900	436	33	13	3	5	2812	1.4	38	--	--	
M-4	800	566	40	13	3	5	1184	0.6	38	--	--	
M-4	2700	826	55	13	3	5	3996	2.0	38	--	15' C.T. Br.	
M-4	2000	932	61	13	3	5	2960	1.5	38	--	--	
M-4	1000	2328	131	16	6	5	2040	0.9	46	--	15' U.T. Br.	
M-4	200	2332	131	16	6	5	408	0.2	46	--	--	
M-4	800	3000	164	18	8	5	1928	0.8	52	--	--	
M-4	5700	3704	197	20	10	5	15,846	6.7	57	--	30' U.T. Br.	
M-4	300	3710	197	20	10	5	834	0.4	57	--	--	
M-4	2200	4392	226	22	12	5	6930	2.8	62	--	--	
M-4	2800	4520	229	22	12	5	8820	3.6	62	--	--	

ENGINEERING AND DESIGN DATA

Area 10 - Childsbury - Cordesville - Witherbee

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	BOTTOM WIDTH Ft. (6)	AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-1	1200	112	11	13	3	5	1776	0.9	38	--	--	
L-2	1800	108	10	13	3	5	2664	1.3	38	--	--	
L-3	2400	98	9	13	3	5	3552	1.8	38	--	--	
L-4	3500	256	21	13	3	5	5180	2.6	38	--	30' - 42"	
L-4	700	268	22	13	3	5	1036	0.5	38	--	--	
L-4	2700	692	48	13	3	5	3996	2.0	38	--	--	
L-4	4600	1320	82	14	4	5	7682	3.7	41	--	15' U.T. Br.	
L-4	1300	1352	84	14	4	5	2171	1.0	41	--	--	
L-5	3700	156	13	13	3	5	5476	2.7	38	--	--	
L-6	5300	340	27	13	3	5	7844	3.9	38	--	30' - 48"	
L-6	1100	374	28	13	3	5	1628	0.8	38	--	--	
L-7	2100	180	15	13	3	5	3108	1.5	38	--	30' - 42"	
L-7	3400	340	27	13	3	5	5032	2.5	38	--	30' - 48"	
L-7	300	380	29	13	3	5	444	0.2	38	--	--	
L-7	300	648	45	13	3	5	444	0.2	38	--	15' U.T. Br.	
L-7	600	652	46	13	3	5	888	0.4	38	--	--	
L-8	800	44	5	13	3	5	1184	0.6	38	--	30' - 24"	
L-8	700	64	7	13	3	5	1036	0.5	38	--	--	
L-8	3000	260	21	13	3	5	4440	2.2	38	--	--	
L-9	1300	92	9	13	3	5	1924	1.0	38	--	30' - 30"	
L-9	1100	112	11	13	3	5	1628	0.8	38	--	--	
L-10	2800	160	14	13	3	5	4144	2.1	38	--	30' - 42"	
L-10	500	168	14	13	3	5	740	0.4	38	--	--	
L-11	1000	76	8	13	3	5	1480	0.7	38	--	30' - 24"	
L-11	1500	188	16	13	3	5	2220	1.1	38	--	30' - 36"	
L-11	2300	304	24	13	3	5	3404	1.7	38	--	--	
L-11	1200	558	38	13	3	5	1776	0.9	38	--	--	
L-12	3400	206	17	13	3	5	5032	2.5	38	--	--	
Total-4	77,600						133,535	63.3				46,541.00
M-5	1100	144	13	13	3	5	1628	0.8	38	--	30' - 42"	
M-5	2900	348	27	13	3	5	4292	2.1	38	--	--	
M-5	1100	696	49	13	3	5	1628	0.8	38	40' - 72"	--	
M-5	1300	728	49	13	3	5	1924	1.0	38	--	--	
L-1	2700	140	12	13	3	5	3996	2.0	38	--	30' - 42"	
L-1	2900	268	22	13	3	5	4292	2.1	38	--	--	
Total-5	12,000						17,760	8.8				7274.00
M-6	1600	88	2	13	3	5	2368	1.2	38	--	40' - 24"	
M-6	3500	304	5	13	3	5	5180	2.6	38	40' - 48"	--	
M-6	1700	444	7	13	3	5	2516	1.2	38	--	--	
M-6	600	566	9	13	3	5	888	0.4	38	--	--	
L-1	1700	60	1	13	3	5	2516	1.2	38	--	--	
L-2	1300	54	1	13	3	5	1924	1.0	38	40' - 24"	--	
L-2	2000	102	2	13	3	5	2960	1.5	38	--	--	
Total-6	12,400						18,352	9.1				6344.00
M-7	1000	60	1	13	3	5	1480	0.7	38	--	--	
M-7	600	76	2	13	3	5	888	0.4	38	--	40' - 24"	
M-7	1900	120	2	13	3	5	2812	1.4	38	--	--	

ENGINEERING AND DESIGN DATA

Area 10 - Childsbury - Cordesville - Witherbee

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-7	1000	270	5	13	3	5	1480	0.7	38	--	--	
M-7	2500	628	9	13	3	5	3700	1.8	38	--	--	
M-7	1500	1204	17	13	3	5	2220	1.1	38	--	15' C.T. Br.	
M-7	1800	1304	18	13	3	5	2664	1.3	38	--	--	
L-1	2600	120	2	13	3	5	3848	1.9	38	40' - 36"	--	
L-1	600	134	3	13	3	5	888	0.4	38	--	--	
L-2	2300	120	2	13	3	5	3404	1.7	38	--	40' - 24"	
L-2	2200	184	4	13	3	5	3256	1.6	38	--	40' - 36"	
L-2	1500	232	4	13	3	5	2220	1.1	38	--	--	
L-3	1500	166	4	13	3	5	2220	1.1	38	--	40' - 36"	
L-3	3800	340	6	13	3	5	5624	2.8	38	--	40' - 30"	
L-3	3000	480	8	13	3	5	4440	2.2	38	--	--	
Total-7	27,800						41,144	20.2				15,691.00
M-8	3300	168	3	13	3	5	4884	2.4	38	30' - 60"	--	
M-8	3000	600	9	13	3	5	4440	2.2	38	--	--	
L-1	3300	288	5	13	3	5	4884	2.4	38	--	--	
Total-8	9600						14.208	7.0				4671.00
M-9	6200	402	7	13	3	5	9176	4.6	38	--	--	
M-9	4200	702	11	13	3	5	6216	3.1	38	--	15' C.T. Br.	
M-9	2500	792	12	13	3	5	3700	1.8	38	--	--	
M-9	1500	1030	15	13	3	5	2220	1.1	38	--	--	
M-9	900	1576	21	13	3	5	1332	0.7	38	--	--	
L-1	2000	118	2	13	3	5	2960	1.5	38	--	30' - 36"	
L-1	1700	186	4	13	3	5	2516	1.2	38	--	--	
L-2	800	116	2	13	3	5	1184	0.6	38	--	--	
L-2	3400	340	6	13	3	5	5032	2.5	38	--	30' - 48"	
L-2	4400	520	8	13	3	5	6512	3.2	38	--	--	
Total-9	27,600						40,848	20.3				14,024.00
M-10	1900	152	3	13	3	5	2812	1.4	38	--	30' - 36"	
M-10	2500	300	5	13	3	5	3700	1.8	38	--	30' - 48"	
M-10	2800	420	7	13	3	5	4144	2.1	38	--	--	
Total-10	7200						10,656	5.3				4235.00
M-11	1700	92	2	13	3	5	2516	1.2	38	--	30' - 30"	
M-11	1200	128	3	13	3	5	1776	0.9	38	--	--	
M-11	1100	238	4	13	3	5	1628	0.8	38	--	--	
L-1	1000	82	2	13	3	5	1480	0.7	38	--	--	
L-1	500	86	2	13	3	5	740	0.4	38	--	--	
Total-11	5500						8140	4.0				2734.00
M-12	2000	270	5	13	3	5	2960	1.5	38	--	30' - 48"	
M-12	1600	470	8	13	3	5	2368	1.2	38	--	--	
M-12	800	804	12	13	3	5	1184	0.6	38	--	--	
M-12	2500	912	13	13	3	5	3700	1.8	38	--	--	
M-12	600	1102	16	13	3	5	888	0.4	38	--	--	
L-1	1600	140	3	13	3	5	2368	1.2	38	--	30" - 36"	
L-1	1700	284	5	13	3	5	2516	1.2	38	--	--	
L-2	1300	128	3	13	3	5	1924	1.0	38	--	30' - 36"	

ENGINEERING AND DESIGN DATA

Area 10 - Childsbury - Cordesville - Witherbee

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-2	600	154	3	13	3	5	888	0.4	38	--	30' - 30"	
L-2	1500	182	3	13	3	5	2220	1.1	38	--	--	
Total-12	14,200						21,016	10.4				8053.00
M-13	5600	358	6	13	3	5	8288	4.1	38	--	30' - 54"	
M-13	1600	426	7	13	3	5	2368	1.2	38	--	--	
M-13	1200	760	11	13	3	5	1776	0.9	38	--	15' R.C. Br.	
M-13	3700	1144	16	13	3	5	5476	2.7	38	--	--	
M-13	1500	1914	25	13	3	5	2220	1.1	38	--	--	
M-13	1000	2278	29	13	3	5	1480	0.7	38	--	--	
M-13	1800	2906	35	13	3	5	2664	1.3	38	--	--	
M-13	2500	5554	61	13	3	5	3700	1.8	38	--	--	
M-13	600	6074	65	14	4	5	1002	0.5	41	--	--	
M-13	800	6242	67	14	4	5	1336	0.6	41	--	--	
M-13	400	6250	67	14	4	5	668	0.3	41	--	--	
M-13	700	8622	89	16	6	5	1428	0.6	46	--	--	
M-13	9200	9312	93	16	6	5	18,768	8.4	46	--	--	
M-13	2200	10,130	101	16	6	5	4488	2.0	46	--	--	
L-1	3100	244	4	13	3	5	4588	2.3	38	--	--	
L-2	5200	662	10	13	3	5	7696	3.8	38	--	15' C.T. Br.	
L-2	800	678	10	13	3	5	1184	0.6	38	--	--	
L-3	5400	280	5	13	3	5	7992	4.0	38	--	30' - 48"	
L-3	1300	316	5	13	3	5	1924	1.0	38	--	--	
L-4	6000	548	9	13	3	5	8880	4.4	38	--	--	
L-5	7700	664	10	13	3	5	11,396	5.7	38	--	--	
L-5	2900	1956	25	13	3	5	4292	2.1	38	--	15' R.C. Br.	
L-5	7300	2564	32	13	3	5	10,804	5.4	38	--	--	
L-6	6500	568	9	13	3	5	9620	4.8	38	--	--	
L-6	4800	928	13	13	3	5	7104	2.9	38	--	--	
L-7	7200	436	7	13	3	5	10,656	5.3	38	--	40' - 60"	
L-7	1700	480	8	13	3	5	2516	1.2	38	--	--	
L-8	1700	76	2	13	3	5	2516	1.2	38	--	--	
L-8	2500	144	3	13	3	5	3700	1.8	38	--	--	
L-9	800	168	3	13	3	5	1184	0.6	38	--	30' - 42"	
L-9	2700	320	6	13	3	5	3996	2.0	38	--	--	
L-9	3400	844	13	13	3	5	5032	2.5	38	--	15' R.C. Br.	
L-9	1500	968	14	13	3	5	2220	1.1	38	--	--	
L-9	6000	1752	35	13	3	5	8880	4.4	38	--	--	
L-9	3000	2356	38	13	3	5	4440	2.2	38	--	--	
L-10	2500	184	4	13	3	5	3700	1.8	38	--	30' - 42" 60' - 24"	
L-10	2300	308	5	13	3	5	3404	1.7	38	--	--	
L-11	2900	188	4	13	3	5	4292	2.1	38	--	--	
L-12	5200	416	7	13	3	5	7696	3.8	38	--	--	
L-13	3300	128	3	13	3	5	4884	2.4	38	--	--	
L-14	2400	200	4	13	3	5	3552	1.8	38	--	30' - 42"	
L-14	1900	338	6	13	3	5	2812	1.4	38	--	--	
L-14	800	626	10	13	3	5	1184	0.6	38	--	--	

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-15	1000	58	1	13	3	5	1480	0.7	38	--	--	
L-16	4200	276	5	13	3	5	6216	3.1	38	--	--	
Total-13	140,800						215,502	104.9				73,753.00
M-14	6200	400	7	13	3	5	9176	4.6	38	--	30' - 60"	
M-14	1500	472	8	13	3	5	2220	1.1	38	--	--	
Total-14	7700						11,396	5.7				4277.00
M-15	1800	140	3	13	3	5	2664	1.3	38	--	--	
M-15	3000	332	6	13	3	5	4440	2.2	38	40' - 60"	--	
M-15	300	340	6	13	3	5	444	0.2	38	--	--	
M-15	8300	1374	19	13	3	5	12,284	6.1	38	--	--	
L-1	800	50	1	13	3	5	1184	0.6	38	--	40' - 18"	
L-1	2000	130	3	13	3	5	2960	1.5	38	--	--	
Total-15	16,200						23,976	11.9				7931.00
Area 10 Grand Total	426,800						657,997	321.1				228,523.00

ENGINEERING AND DESIGN DATA

Area 11 - Jamestown - Shulerville - Honey Hill

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1	3900	256	42	13	3	5	5772	2.9	38	40' - 24"	40' - 42"	
M-1	1800	388	60	13	3	5	2664	1.3	38	--	--	
M-1	6500	1568	191	18	8	5	15,665	6.9	52	--	--	
L-1	1700	248	41	13	3	5	2516	1.2	38	40' - 24"	40' - 36"	
L-1	2300	416	62	13	3	5	3404	1.7	38	--	--	
L-1	1700	700	97	16	6	5	3468	1.6	46	--	--	
L-2	1300	212	35	13	3	5	1924	1.0	38	--	--	
Total-1	19,200						35,413	16.6				11,927.00
M-2	9300	1416	87	16	6	5	18,972	8.5	46	--	15' U.T. Br.	
M-2	3800	2680	149	19	9	5	9842	4.3	55	--	--	
M-2	5500	3844	201	20	10	5	15,290	6.4	57	--	--	
M-2	2300	8540	394	32	22	5	14,000	5.3	89	--	--	
M-2	1900	9440	428	34	24	5	10,203	3.8	94	--	--	
M-2	2400	10,460	466	36	26	5	13,776	5.1	99	--	--	
L-1	8700	936	61	13	3	5	12,876	6.4	38	--	--	
L-2	6200	780	53	13	3	5	9176	4.6	38	--	15' U.T. Br.	
											15' U.T. Br.	
L-3	7900	1240	78	15	5	5	14,615	6.9	44	--	--	
L-3	5300	1880	112	17	7	5	11,766	5.2	49	--	--	
L-3	4500	3244	175	22	12	5	14,175	5.8	62	--	30' R.C. Br.	
L-3	4500	3772	197	24	14	5	15,840	6.4	68	--	30' R.C. Br.	
L-3	4000	4012	207	24	14	5	14,080	5.7	68	--	--	
L-4	8900	1000	66	14	4	5	14,863	7.2	41	--	--	
L-5	3800	344	27	13	3	5	5624	2.8	38	--	30' - 54"	
L-5	4000	532	38	13	3	5	5920	2.9	38	--	--	
L-6	3100	416	31	13	3	5	4588	2.3	38	--	30' - 60"	
L-6	4000	792	54	13	3	5	5920	2.9	38	--	--	
L-7	6900	828	55	13	3	5	10,212	5.1	38	--	--	
Total-2	97,500						221,738	97.6				72,931.00
M-3	6800	828	55	15	5	5	12,580	5.9	44	--	--	
M-3	4800	1868	111	20	10	5	13,344	5.6	57	--	--	
M-3	6400	5280	264	36	26	5	36,736	13.7	99	--	30' C.T. Br	
M-3	3100	6864	327	45	35	5	22,940	8.4	124	--	--	
M-3	4400	9644	435	50	40	5	36,652	13.2	137	--	--	
M-3	1400	9952	443	55	45	5	12,964	4.6	150	--	15' R.C. Br	
M-3	2000	10,024	446	55	45	5	18,520	6.6	150	--	--	
M-3	3300	10,688	476	55	45	5	30,558	10.9	150	--	--	
M-3	1000	13,688	587	70	60	5	12,040	4.2	190	--	--	
M-3	2500	16,236	672	70	60	5	30,100	10.6	190	--	--	
M-3	3000	16,816	683	70	60	5	36,120	12.7	190	--	--	
M-3	6800	18,448	750	80	70	5	94,452	32.9	217	--	--	
M-3	5200	19,740	786	80	70	5	72,228	25.2	217	--	--	
M-3	1600	20,788	812	80	70	5	22,224	7.8	217	--	--	
M-3	8400	23,156	905	90	80	5	132,216	45.9	244	--	--	
M-3	10,500	27,520	1032	100	90	5	184,695	63.9	271	--	--	
L-1	4100	384	29	13	3	5	6068	3.0	38	--	--	
L-2	3300	760	52	14	4	5	5511	2.7	41	--	15' C.T. Br.	
L-2	11,000	1820	108	20	10	5	30,580	12.9	57	--	--	

ENGINEERING AND DESIGN DATA

Area 11 - Jamestown - Shulerville - Honey Hill

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-3	6300	1080	70	16	6	5	12,852	5.8	46	--	15' C.T. Br.	
L-3	1800	1144	73	16	6	5	3672	1.7	46	--	--	
L-4	11,000	1248	78	17	7	5	24,420	10.9	49	--	--	
L-5	8900	880	59	15	5	5	16,465	7.8	44	--	--	
L-6	12,200	1620	99	19	9	5	31,598	13.7	55	--	15' C.T. Br.	
L-7	5600	268	22	13	3	5	8288	4.1	38	--	30' - 36"	
L-8	7000	384	29	13	3	5	10,360	5.1	38	--	40' - 42" 50' - 48"	
L-9	3700	424	32	13	3	5	5476	2.7	38	--	50' - 60"	
L-9	5000	732	50	13	3	5	7400	3.7	38	--	15' U.T. Br.	
L-9	2700	788	54	13	3	5	3996	2.0	38	--	--	
L-9	1700	2036	118	17	7	5	3774	1.7	49	--	15' C.T. Br.	
L-9	1200	2092	121	17	7	5	2664	1.2	49	--	--	
L-9	2200	2892	158	20	10	5	6116	2.6	57	--	--	
L-10	7900	360	27	13	3	5	11,692	5.8	38	--	30' - 54"	
L-10	1800	960	63	14	4	5	3006	1.4	41	--	--	
L-11	5200	548	40	13	3	5	7696	3.8	38	--	--	
L-12	3500	208	18	13	3	5	5180	2.6	38	--	--	
L-13	7200	720	50	13	3	5	10,656	5.3	38	--	15' C.T. Br. 30' - 54"	
L-14	5300	508	37	13	3	5	7844	3.9	38	--	15' C.T. Br.	
L-14	2600	716	49	13	3	5	3848	1.9	38	--	--	
L-14	3600	876	59	13	3	5	5328	2.6	38	--	--	
L-14	3000	2424	136	19	9	5	7770	3.4	55	--	--	
L-15	4300	188	16	13	3	5	6364	3.2	38	--	30' - 42"	
L-16	5000	476	35	13	3	5	7400	3.7	38	--	40' - 54"	
L-16	8200	1252	78	17	7	5	18,204	8.1	49	--	15' C.T. Br.	
L-17	5700	296	23	13	3	5	8436	4.2	38	--	40' - 36" 40' - 36"	
L-18	8000	692	48	13	3	5	11,840	5.9	38	--	40' - 48" 15' R.C. Br.	
L-19	7200	880	59	13	3	5	10,656	5.3	38	--	--	
L-20	4800	480	35	13	3	5	7104	3.5	38	--	15' C.T. Br.	
L-20	6200	968	63	13	3	5	9176	4.6	38	--	15' C.T. Br.	
L-21	3500	420	8	13	3	5	5180	2.6	38	--	30' - 60"	
L-21	10,700	1692	22	13	3	5	15,836	7.9	38	--	15' C.T. Br.	
L-22	4800	308	6	13	3	5	7104	3.5	38	--	30' - 48"	
L-22	7200	1048	15	13	3	5	10,656	5.3	38	--	--	
L-22	7700	2144	27	13	3	5	11,396	5.7	38	--	30' R.C. Br.	
L-22	4700	2816	34	13	3	5	6956	3.5	38	--	--	
L-22	2700	3344	40	13	3	5	3996	2.0	38	--	--	
L-23	3100	336	6	13	3	5	4588	2.3	38	--	--	
L-24	4000	428	7	13	3	5	5920	2.9	38	--	30' - 54"	
Total-3	296,800						1,161,441	458.6				350,063.00
M-4	8200	996	14	13	3	5	12,136	6.0	38	--	30' - 42"	
M-4	10,000	2628	33	13	3	5	14,800	7.3	38	--	--	
L-1	8000	632	10	13	3	5	11,840	5.9	38	--	30' - 48"	
Total-4	26,200						38,776	19.2				12,723.00

ENGINEERING AND DESIGN DATA

Area 11 - Jamestown - Shulerville - Honey Hill

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-5	3500	456	7	13	3	5	5180	2.6	38	--	--	
M-5	3200	960	14	13	3	5	4736	2.4	38	--	--	
L-1	4200	368	6	13	3	5	6216	3.1	38	--	30' - 42"	
Total-5	10,900						16,132	8.1				5350.00
M-6	5700	564	9	13	3	5	8436	4.2	38	--	40' - 54"	
M-6	8200	1072	15	13	3	5	12,136	6.0	38	--	15' U.T. Br.	
Total-6	13,900						20,572	10.2				7594.00
M-7	11,000	816	12	13	3	5	16,280	8.1	38	--	--	
M-7	2300	872	13	13	3	5	3404	1.7	38	--	--	
M-7	2800	2128	27	13	3	5	4144	2.1	38	--	--	
L-1	6300	512	8	13	3	5	9324	4.6	38	--	30' - 60"	
L-2	1400	84	2	13	3	5	2072	1.0	38	--	--	
L-2	1000	572	9	13	3	5	1480	0.7	38	--	15' C.T. Br.	
L-2	1600	640	10	13	3	5	2368	1.2	38	--	--	
L-3	5500	456	7	13	3	5	8140	4.0	38	--	--	
Total-7	31,900						47,212	23.4				15,730.00
M-8	10,000	1976	25	13	3	5	14,800	7.3	38	--	30' C.T. Br.	
M-8	9600	4088	47	13	3	5	14,208	7.1	38	--	--	
M-8	3700	5688	61	13	3	5	5476	2.7	38	--	--	
L-1	2500	236	4	13	3	5	3700	1.8	38	--	--	
L-1	1800	680	10	13	3	5	2664	1.3	38	--	--	
L-1	1400	1112	16	13	3	5	2072	1.0	38	--	--	
L-2	5600	372	6	13	3	5	8288	4.1	38	--	--	
L-3	4500	372	6	13	3	5	6660	3.3	38	--	--	
L-4	6000	748	11	13	3	5	8880	4.4	38	--	15' C.T. Br.	
L-4	1900	1252	18	13	3	5	2812	1.4	38	--	--	
L-5	5300	440	7	13	3	5	7844	3.9	38	--	--	
Total-8	52,300						77,404	38.3				25,391.00
M-9	3800	1060	15	13	3	5	5624	2.8	38	--	15' U.T. Br.	
M-9	6800	1780	23	13	3	5	10,064	5.0	38	--	--	
Total-9	10,600						15,688	7.8				5198.00
M-10	5000	444	7	13	3	5	7400	3.7	38	--	30' - 36" 30' - 60"	
M-10	2200	528	9	13	3	5	3256	1.6	38	--	--	
Total-10	7200						10,656	5.3				4469.00
M-11	6900	624	10	13	3	5	10,212	5.1	38	--	15' C.T. Br.	
Total-11	6900						10,212	5.1				3812.00
Area 11 Grand Total	573,400						1,655,244	690.2				515,188.00

ENGINEERING AND DESIGN DATA

Area 12 - Bethera - Huger - Eccles Church - Green Bay

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1	7800	896	13	13	3	5	11,544	5.7	38	--	--	
M-1	10,500	3424	41	13	3	5	15,540	7.7	38	--	--	
M-1	3100	5376	52	14	4	5	5177	2.5	41	--	30' C.T. Br.	
M-1	5200	6528	70	16	6	5	10,608	4.8	46	--	--	
M-1	6800	7796	81	17	7	5	15,096	6.7	49	--	45' R.C. Br.	
M-1	5000	8268	85	17	7	5	11,100	4.9	49	--	--	
M-1	4400	11,176	110	20	10	5	12,232	5.2	57	--	--	
M-1	1100	26,780	230	32	22	5	5500	2.1	89	--	--	
M-1	1300	27,552	234	32	22	5	6500	2.5	89	--	--	
M-1	1800	28,160	238	34	24	5	9666	3.6	94	--	60' C.T. Br.	
M-1	2500	28,416	240	34	24	5	13,425	5.1	94	--	--	
M-1	3500	28,920	244	34	24	5	18,795	7.1	94	--	--	
M-1	2200	29,556	249	34	24	5	11,814	4.4	94	--	--	
M-1	2800	30,432	254	34	24	5	15,036	5.7	94	--	--	
M-1	4400	30,872	258	36	26	5	25,256	9.4	99	--	--	
L-1	3900	468	8	13	3	5	5772	2.9	38	--	--	
L-2	5100	648	10	13	3	5	7548	3.7	38	--	--	
L-3	2700	236	4	13	3	5	3996	2.0	38	--	--	
L-3	3900	852	13	13	3	5	5772	2.9	38	--	15' U.T. Br.	
L-3	1600	1612	22	13	3	5	2368	1.2	38	--	--	
L-4	3800	316	6	13	3	5	5624	2.8	38	--	--	
L-5	3600	220	4	13	3	5	5328	2.6	38	--	30' - 48"	
L-5	3200	524	9	13	3	5	4736	2.4	38	--	15' C.T. Br.	
L-5	2500	688	11	13	3	5	3700	1.8	38	--	--	
L-6	10,200	684	11	13	3	5	15,096	7.5	38	--	40' - 24"	
L-6	1500	864	13	13	3	5	2220	1.1	38	--	--	
L-6	1200	1228	17	13	3	5	1776	0.9	38	--	--	
L-6	7200	2676	33	13	3	5	10,656	5.3	38	--	--	
L-7	3200	132	3	13	3	5	4736	2.4	38	--	40' - 30" 60' - 24"	
L-8	5000	296	5	13	3	5	7400	3.7	38	--	40' - 54"	
L-9	12,800	448	7	13	3	5	18,944	9.4	38	--	30' - 48" 40' - 48"	
L-9	1500	884	13	13	3	5	2220	1.1	38	--	--	
L-10	8900	368	6	13	3	5	13,172	6.5	38	--	40' - 54" 30' - 48"	
L-11	5100	824	12	13	3	5	7548	3.7	38	--	--	
L-11	5500	2564	32	13	3	5	8140	4.0	38	--	--	
L-11	2800	4628	52	14	4	5	4676	2.2	41	--	30' C.T. Br.	
L-11	3600	5096	57	15	5	5	6660	3.1	44	--	--	
L-11	2500	5784	63	16	6	5	5100	2.3	46	--	--	
L-11	5200	7904	82	17	7	5	11,544	5.1	49	--	--	
L-11	6600	9528	95	18	8	5	15,906	7.0	51	--	--	
L-11	7200	10,120	101	19	9	5	18,648	8.1	55	--	--	
L-11	2600	10,400	104	19	9	5	6734	2.9	55	--	--	
L-11	1600	14,788	139	24	14	5	5632	2.3	68	--	45' R.C. Br.	
L-11	2800	15,484	145	24	14	5	9856	4.0	68	--	--	
L-12	6700	800	12	13	3	5	9916	4.9	38	--	--	

ENGINEERING AND DESIGN DATA

Area 12 - Bethera - Huger - Eccles Church - Green Bay

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-13	4800	644	10	13	3	5	7104	3.5	38	--	--	
L-14	7600	1412	19	13	3	5	11,248	5.5	38	--	--	
L-15	4900	504	8	13	3	5	7252	3.6	38	--	--	
L-16	5200	508	8	13	3	5	7696	3.8	38	--	30' - 42"	
L-17	7500	1740	23	13	3	5	11,100	5.5	38	--	--	
L-18	6700	780	12	13	3	5	9916	4.9	38	--	--	
L-19	1600	352	6	13	3	5	2368	1.2	38	--	--	
L-20	3500	200	4	13	3	5	5180	2.6	38	--	30' - 24"	
											50' - 24"	
L-21	6200	696	11	13	3	5	9176	4.6	38	--	--	
L-21	5200	2192	28	13	3	5	7696	3.8	38	--	--	
L-21	6300	3048	37	13	3	5	9324	4.6	38	--	15' C.T. Br.	
L-21	2100	4316	50	14	4	5	3507	1.7	41	--	--	
L-22	10,500	1200	17	13	3	5	15,540	7.7	38	--	30' - 48"	
L-23	6200	424	7	13	3	5	9176	4.6	38	--	--	
L-24	11,600	1020	15	13	3	5	17,168	8.5	38	--	30' - 48"	
											15' C.T. Br.	
L-24	1800	1100	16	13	3	5	2664	1.3	38	--	--	
L-25	3300	360	6	13	3	5	4884	2.4	38	--	30' - 48"	
L-25	5700	572	9	13	3	5	8436	4.2	38	--	15' U.T. Br.	
											15' U.T. Br.	
L-26	5600	728	11	13	3	5	8288	4.1	38	--	--	
L-27	5400	496	8	13	3	5	7992	4.0	38	--	30' - 42"	
L-28	3500	236	4	13	3	5	5180	2.6	38	--	--	
L-29	7200	520	8	13	3	5	10,656	5.3	38	--	--	
L-30	5100	272	5	13	3	5	7548	3.7	38	--	--	
L-30	3800	656	10	13	3	5	5624	2.8	38	--	--	
L-31	2000	172	3	13	3	5	2960	1.5	38	--	--	
Total-1	329,700						616,396	285.2				208,255.00
M-2	6500	388	7	13	3	5	9620	4.8	38	--	--	
M-2	6100	1544	21	13	3	5	9028	4.5	38	--	--	
M-2	1000	4252	48	14	4	5	1670	0.7	41	--	30' C.T. Br.	
M-2	7600	5052	57	15	5	5	14,060	6.6	44	--	--	
M-2	5500	9140	93	18	8	5	13,255	5.8	52	--	30' C.T. Br.	
M-2	1600	9200	93	18	8	5	3856	1.7	52	--	--	
M-2	2200	10,232	99	19	9	5	5698	2.5	55	--	--	
M-2	2800	12,372	120	22	12	5	8820	3.6	62	--	--	
M-2	5400	13,328	127	22	12	5	17,010	6.9	62	--	45' C.T. Br.	
M-2	3600	13,648	130	22	12	5	11,340	4.6	62	--	--	
M-2	2000	14,952	140	24	14	5	7040	2.8	68	--	--	
L-1	5600	656	10	13	3	5	8288	4.1	38	--	15' C.T. Br.	
L-1	2600	776	12	13	3	5	3848	1.9	38	--	--	
L-2	7200	800	12	13	3	5	10,656	5.3	38	--	15' C.T. Br.	
L-2	1500	908	13	13	3	5	2220	1.1	38	--	--	
L-2	1900	2636	33	13	3	5	2812	1.4	38	--	--	
L-3	5000	700	11	13	3	5	7400	3.7	38	--	--	
L-3	1700	1660	22	13	3	5	2516	1.2	38	--	--	
L-4	7800	900	13	13	3	5	11,544	5.7	38	--	--	

ENGINEERING AND DESIGN DATA

Area 12 - Bethera - Huger - Eccles Church - Green Bay

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-5	13,900	1224	17	13	3	5	20,572	10.2	38	--	--	
L-5	1800	1508	20	13	3	5	2664	1.3	38	--	--	
L-6	4600	248	5	13	3	5	6808	3.4	38	--	30' - 48"	
L-7	6200	432	7	13	3	5	9176	4.6	38	--	--	
L-7	1000	1076	15	13	3	5	1480	0.7	38	--	--	
L-7	4100	1572	21	13	3	5	6068	3.0	38	--	--	
L-7	5900	2064	26	13	3	5	8732	4.3	38	--	15' C.T. Br.	
L-8	6800	616	10	13	3	5	10,064	5.0	38	--	--	
L-9	2700	240	4	13	3	5	3996	2.0	38	--	--	
L-10	2500	188	4	13	3	5	3700	1.8	38	--	--	
L-11	10,700	848	13	13	3	5	15,836	7.9	38	--	15' C.T. Br.	
L-11	2500	948	14	13	3	5	3700	1.8	38	--	--	
L-12	6100	400	7	13	3	5	9028	4.5	38	--	30' - 48" 15' C.T. Br.	
L-12	3000	1284	18	13	3	5	4440	2.2	38	--	--	
L-13	6700	644	10	13	3	5	9916	4.9	38	--	--	
L-14	2900	128	3	13	3	5	4292	2.1	38	--	--	
L-14	2300	424	7	13	3	5	3404	1.7	38	--	30' - 60"	
L-14	4100	740	11	13	3	5	6068	3.0	38	--	--	
L-15	3700	188	4	13	3	5	5476	2.7	38	--	--	
L-16	2900	124	3	13	3	5	4292	2.1	38	--	--	
L-17	4400	252	5	13	3	5	6512	3.2	38	--	--	
L-18		296	Present canal as constructed is considered adequate							--	--	
L-19	6200	316	5	13	3	5	9176	4.6	38	--	--	
L-19	2800	1232	17	13	3	5	4144	2.1	38	--	--	
L-20	4500	456	7	13	3	5	6660	3.3	38	--	--	
L-20	1700	792	12	13	3	5	2516	1.2	38	--	--	
L-21	3700	252	5	13	3	5	5476	2.7	38	--	--	
Total-2	195,300						324,877	155.2				107,121.00
M-3	3600	444	7	13	3	5	5328	2.6	38	--	40' - 54"	
M-3	7500	1208	17	13	3	5	11,100	5.5	38	--	--	
M-3	7400	1848	24	13	3	5	10,952	5.4	38	--	30' C.T. Br.	
M-3	2600	3880	45	14	4	5	4342	2.1	41	--	--	
M-3	900	5140	57	15	5	5	1665	0.8	44	--	--	
M-3	7200	11,260	111	20	10	5	20,016	8.4	57	--	--	
M-3	1800	14,380	135	24	14	5	6336	2.6	68	--	--	
M-3	5000	16,404	151	24	14	5	17,600	7.1	68	--	--	
M-3	2800	17,932	163	26	16	5	10,892	4.3	73	--	--	
M-3	5900	20,916	186	28	18	5	25,134	9.8	78	--	--	
L-1	5200	412	7	13	3	5	7696	3.8	38	--	--	
L-1	3300	1636	22	13	3	5	4884	2.4	38	--	--	
L-1	5700	1956	25	13	3	5	8436	4.2	38	--	--	
L-2	10,700	896	13	13	3	5	15,836	7.9	38	--	--	
L-3	3700	240	4	13	3	5	5476	2.7	38	--	30' - 30"	
L-4	5800	308	5	13	3	5	8584	4.3	38	--	--	
L-4	3200	852	13	13	3	5	4736	2.4	38	--	15' C.T. Br.	
L-4	3000	988	14	13	3	5	4440	2.2	38	--	--	
L-5	2100	292	5	13	3	5	3108	1.5	38	--	--	

ENGINEERING AND DESIGN DATA

Area 12 - Bethera - Huger - Eccles Church - Green Bay

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-6	5800	452	36	13	3	5	8584	4.3	38	--	--	
L-6	6100	852	57	13	3	5	9028	4.5	38	--	--	
L-6	2300	1388	84	15	5	5	4255	2.0	44	--	--	
L-6		1484	Present canal as constructed is considered adequate							--	--	
L-6		3408	Present canal as constructed is considered adequate							--	--	
L-6		4528	Present canal as constructed is considered adequate							--	--	
L-6		5164	Present canal as constructed is considered adequate							--	--	
L-7	3600	388	30	13	3	5	5328	2.6	38	--	--	
L-8	8800	868	58	13	3	5	13,024	6.5	38	--	15' C.T. Br.	
L-8	4000	1804	107	16	6	5	8160	3.7	46	--	--	
L-8		1852	Present canal as constructed is considered adequate							--	--	
L-9	6400	664	47	13	3	5	9472	4.7	38	--	--	
L-10	12,900	908	60	13	3	5	19,092	9.5	38	--	30' - 24" 15' C.T. Br.	
L-10	3500	1096	70	14	4	5	5845	2.8	41	--	--	
L-11	5300	408	31	13	3	5	7844	3.9	38	--	--	
L-12	6100	544	9	13	3	5	9028	4.5	38	--	50' - 36" 15' C.T. Br.	
L-12	2600	992	14	13	3	5	3848	1.9	38	--	15' C.T. Br.	
L-12	3700	2140	27	13	3	5	5476	2.7	38	--	--	
L-12	2600	2652	33	13	3	5	3848	1.9	38	--	15' C.T. Br.	
L-12	2000	3060	37	13	3	5	2960	1.5	38	--	--	
L-13	6900	348	6	13	3	5	10,212	5.1	38	--	--	
L-14	4000	288	5	13	3	5	5920	2.9	38	--	--	
L-14	2200	528	8	13	3	5	3256	1.6	38	--	--	
L-14	1300	888	13	13	3	5	1924	1.0	38	--	--	
L-15	3400	160	3	13	3	5	5032	2.5	38	--	--	
L-16	6000	336	6	13	3	5	8880	4.4	38	--	--	
L-17	3000	176	3	13	3	5	4440	2.2	38	--	30' - 36"	
L-17	800	404	7	13	3	5	1184	0.6	38	--	--	
L-18	2600	212	4	13	3	5	3848	1.9	38	--	--	
L-19	5100	336	6	13	3	5	7548	3.7	38	--	40' - 42"	
L-20	10,600	1288	18	13	3	5	15,688	7.8	38	--	15' C.T. Br.	
L-20	4300	1688	22	13	3	5	6364	3.2	38	--	--	
L-21	5900	412	7	13	3	5	8732	4.3	38	--	--	
L-22	7100	368	6	13	3	5	10,508	5.2	38	--	40' - 30" 30' - 54"	
L-22	2900	620	10	13	3	5	4292	2.1	38	--	--	
L-22	600	876	13	13	3	5	888	0.4	38	--	15' C.T. Br.	
L-22	2600	996	14	13	3	5	3848	1.9	38	--	--	
L-23	5500	188	3	13	3	5	8140	4.0	38	--	30' - 24"	
L-24	6500	696	49	13	3	5	9620	4.8	38	--	--	
L-24	4900	1004	66	14	4	5	8183	3.9	41	--	15' C.T. Br.	
L-24	900	1560	95	16	6	5	1836	0.8	46	--	15' C.T. Br.	
L-24	2900	1836	109	16	6	5	5916	2.7	46	--	--	
L-24	4000	2436	137	19	9	5	10,360	4.5	55	--	--	
L-25	2200	108	10	13	3	5	3256	1.6	38	--	--	
L-26	4900	284	25	13	3	5	7252	3.6	38	--	30' - 48"	

ENGINEERING AND DESIGN DATA

Area 12 - Bethera - Huger - Eccles Church - Green Bay

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-26	1200	540	39	13	3	5	1776	0.9	38	--	--	
L-27	3100	220	20	13	3	5	4588	2.3	38	--	30' - 48"	
L-28	3900	224	19	13	3	5	5772	2.9	38	--	30' - 42"	
L-29	2500	148	13	13	3	5	3700	1.8	38	--	--	
L-29	3100	364	28	13	3	5	4588	2.3	38	--	--	
L-30	2000	108	10	13	3	5	2960	1.5	38	--	--	
Total-3	280,000						472,864	225.4				154,994.00
M-4	2700	180	15	13	3	5	3996	2.0	38	--	15' C.T. Br.	
M-4	3900	708	49	13	3	5	5772	2.9	38	--	--	
L-1	5800	368	28	13	3	5	8584	4.3	38	--	--	
Total-4	12,400						18,352	9.2				6260.00
M-5	5200	280	22	13	3	5	7696	3.8	38	--	30' - 42"	
M-5	2300	572	41	13	3	5	3404	1.7	38	--	--	
M-5	2100	676	47	13	3	5	3108	1.5	38	--	--	
L-1	2000	116	11	13	3	5	2960	1.5	38	--	30' - 24"	
Total-5	11,600						17,168	8.5				5857.00
M-6	5800	336	6	13	3	5	8584	4.3	38	--	40' - 42"	
M-6	1600	496	8	13	3	5	2368	1.2	38	--	30' - 42"	
M-6	2500	624	10	13	3	5	3700	1.8	38	--	--	
M-6	500	744	11	13	3	5	740	0.4	38	--	--	
M-6	7700	1600	22	13	3	5	11,396	5.7	38	--	15' C.T. Br.	
L-1	2200	104	2	13	3	5	3256	1.6	38	--	50' - 30"	
L-2	700	408	7	13	3	5	1036	0.5	38	--	50' - 36"	
Total-6	21,000						31,080	15.5				12,452.00
M-7	6800	556	9	13	3	5	10,064	5.0	38	--	15' C.T. Br.	
M-7	5500	1124	16	13	3	5	8140	4.0	38	--	--	
M-7	3300	1596	21	13	3	5	4884	2.4	38	--	15' C.T. Br.	
M-7	2300	2776	34	13	3	5	3404	1.7	38	--	--	
L-1	3900	256	5	13	3	5	5772	2.9	38	--	30' - 36"	
L-2	4000	264	5	13	3	5	5920	2.9	38	--	--	
L-2	2700	1044	15	13	3	5	3996	2.0	38	--	--	
L-3	3500	224	4	13	3	5	5180	2.6	38	--	--	
L-4	5800	432	7	13	3	5	8584	4.3	38	--	30' - 54"	
Total-7	37,800						55,944	27.8				19,374.00
Area 12 Grand Total	887,800						1,536,681	726.8				514,313.00

ENGINEERING AND DESIGN DATA

Area 13 - Pompion Chapel - Charity Church - Wando - Daniel's Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	BOTTOM WIDTH Ft. (6)	AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1	1000	114	11	13	3	5	1480	0.7	38	--	--	
M-1	3600	366	28	13	3	5	5328	2.6	38	--	--	
L-1	1700	68	7	13	3	5	2516	1.2	38	--	20' - 30"	
Total-1	6300						9324	4.5				2969.00
M-2		308	Present canal as constructed is considered adequate							--	--	
M-2	2100	528	9	13	3	5	3108	1.5	38	--	15' U.T. Br	
M-2	3000	738	11	13	3	5	4440	2.2	38	40' - 72"	--	
M-2	1900	814	12	13	3	5	2812	1.4	38	--	--	
Total-2	7000						10,360	5.1				4546.00
M-3	4400	236	4	13	3	5	6512	3.2	38	40' - 72"	--	
M-3	2300	312	5	13	3	5	3404	1.1	38	--	--	
M-3	500	480	8	13	3	5	740	0.4	38	--	--	
L-1	3800	156	3	13	3	5	5624	2.8	38	--	--	
Total-3	11,000						16,280	7.5				5830.00
M-4	3400	312	5	13	3	5	5032	2.5	38	--	--	
M-4		476	Present canal as constructed is considered adequate							--	--	
M-4		852	Present canal as constructed is considered adequate							--	--	
M-4		1232	Present canal as constructed is considered adequate							--	--	
M-4	1600	1686	22	13	3	5	2368	1.2	38	--	--	
M-4	1500	2416	30	13	3	5	2220	1.1	38	--	15' C.T. Br.	
M-4	1000	2456	31	13	3	5	1480	0.7	38	--	--	
M-4	4700	3108	37	13	3	5	6956	3.5	38	--	--	
L-1	4000	296	5	13	3	5	5920	2.9	38	--	30' - 48"	
L-2	5500	264	4	13	3	5	8140	4.0	38	--	30' - 42"	
L-3	3800	404	6	13	3	5	5624	2.8	38	--	--	
L-4	3100	120	2	13	3	5	4588	2.3	38	--	--	
L-4	1400	248	4	13	3	5	2072	1.0	38	--	30' - 42"	
L-4	1300	284	5	13	3	5	1924	1.0	38	--	--	
L-4	1300	640	10	13	3	5	1924	1.0	38	--	--	
L-5	900	28	1	13	3	5	1332	0.7	38	--	--	
L-6	4000	196	3	13	3	5	5920	2.9	38	--	--	
L-6	900	316	5	13	3	5	1332	0.7	38	--	--	
L-7	2200	100	2	13	3	5	3256	1.6	38	--	--	
L-8	4600	192	3	13	3	5	6808	3.4	38	--	30' - 36"	
Total-4	45,200						66,896	33.3				22,841.00
M-5	9200	620	10	13	3	5	13,616	6.8	38	--	--	
M-5	1400	1000	14	13	3	5	2072	1.0	38	--	--	
L-1	4400	320	5	13	3	5	6512	3.2	38	--	30' - 30"	
Total-5	15,000						22,200	11.0				6946.00
M-6	3800	156	13	13	3	5	5624	2.8	38	--	--	
M-6	8400	1204	76	15	5	5	15,540	7.3	44	--	--	
M-6	5200	2168	125	19	9	5	13,468	5.8	55	--	15' C.T. Br. 15' C.T. Br.	
M-6	10,800	2916	160	22	12	5	34,020	13.9	62	--	--	
M-6	2500	3276	177	24	14	5	8800	3.6	68	--	--	
M-6	1800	4244	219	26	16	5	7002	2.8	73	--	--	

ENGINEERING AND DESIGN DATA

Area 13 - Pompion Chapel - Charity Church - Wando - Daniel's Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-6	4700	4840	242	28	18	5	20,022	7.8	78	--	--	
M-6	1200	11,272	493	50	40	5	9996	3.6	137	--	--	
M-6	1400	12,488	539	55	45	5	12,964	4.6	150	--	--	
L-1	1700	68	7	13	3	5	2516	1.2	38	--	--	
L-2	6200	472	35	13	3	5	9176	4.6	38	--	--	
L-3	2700	168	14	13	3	5	3996	2.0	38	--	--	
L-4	6300	504	37	13	3	5	9324	4.6	38	--	50' - 36"	
L-4	1600	780	54	13	3	5	2368	1.2	38	--	--	
L-5	3500	232	19	13	3	5	5180	2.6	38	--	30' - 36"	
L-6	6100	440	33	13	3	5	9028	4.5	38	--	30' - 42"	
L-6	1400	844	57	13	3	5	2072	1.0	38	--	--	
L-6	3400	1276	80	15	5	5	6920	3.0	44	--	--	
L-6	2000	1528	93	16	6	5	4080	1.8	46	--	--	
L-6	3200	2372	134	18	8	5	7712	3.4	52	--	45' C.T. Br.	
L-6	9800	6392	310	32	22	5	49,000	18.7	89	--	--	
L-7	2200	268	22	13	3	5	3256	1.6	38	--	--	
L-8	5200	240	20	13	3	5	7696	3.8	38	--	30' - 42"	
L-9	5500	148	13	13	3	5	8140	4.0	38	--	--	
L-10	11,200	584	42	13	3	5	16,576	8.2	38	--	--	
L-11	2600	176	15	13	3	5	3848	1.9	38	--	--	
L-11	2000	444	33	13	3	5	2960	1.5	38	--	--	
L-11	5000	1128	72	14	4	5	8350	4.0	41	--	15' U.T. Br.	
L-11	3800	1652	101	16	6	5	7752	3.5	46	--	--	
L-11	7600	2708	148	19	9	5	19,684	8.5	55	--	--	
L-12	2600	144	13	13	3	5	3848	1.9	38	--	30' - 30"	
L-13	4700	276	22	13	3	5	6956	3.5	38	--	--	
L-14	3100	140	13	13	3	5	4588	2.3	38	--	30' - 36"	
L-14	1600	288	23	13	3	5	2368	1.2	38	--	--	
L-15	2500	98	9	13	3	5	3700	1.8	38	--	30' - 30"	
L-16	5700	320	25	13	3	5	8436	4.2	38	--	--	
L-17	5300	224	19	13	3	5	7844	3.9	38	--	--	
L-18	7100	328	25	13	3	5	10,508	5.2	38	--	--	
L-19	5000	272	22	13	3	5	7400	3.7	38	--	--	
L-19	2200	880	59	13	3	5	3256	1.6	38	--	--	
L-19	4000	1028	68	13	3	5	5920	2.9	38	--	--	
L-20	5200	360	27	13	3	5	7696	3.8	38	--	--	
Total-6	181,800						389,590	173.8				120,088.00
M-7	6400	540	39	13	3	5	9472	4.7	38	--	15' U.T. Br.	
M-7	2800	992	65	14	4	5	4676	2.2	41	--	15' R.C. Br.	
M-7	2800	1220	76	15	5	5	5180	2.4	44	--	--	
M-7	3400	2148	124	18	8	5	8194	3.6	52	--	15' C.T. Br.	
M-7	2700	2298	131	18	8	5	6507	2.9	52	--	--	
L-1	1900	84	8	13	3	5	2812	1.4	38	--	--	
L-2	7400	508	37	13	3	5	10,952	5.4	38	--	--	
Total-7	27,400						47,793	22.6				16,829.00
M-8	5500	216	4	13	3	5	8140	4.0	38	--	30' - 36"	
Total-8	5500						8140	4.0				2848.00

ENGINEERING AND DESIGN DATA

Area 13 - Pompion Chapel - Charity Church - Wando - Daniel's Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-9	6500	524	8	13	3	5	9620	4.8	38	--	--	
Total-9	6500						9620	4.8				2884.00
M-10	3800	170	3	13	3	5	5624	2.8	38	--	30' - 30"	
Total-10	3800						5624	2.8				1991.00
M-11	3600	304	5	13	3	5	5328	2.6	38	--	--	
M-11	3500	688	11	13	3	5	5180	2.6	38	--	--	
L-1	5000	244	4	13	3	5	7400	3.7	38	--	--	
Total-11	12,100						17,908	8.9				5362.00
M-12	3600	208	3	13	3	5	5328	2.6	38	--	30' - 30"	
Total-12	3600						5328	2.6				1892.00
M-13	5100	332	5	13	3	5	7548	3.7	38	--	--	
Total-13	5100						7548	3.7				2250.00
M-14	2400	108	2	13	3	5	3552	1.8	38	--	--	
M-14	2200	320	5	13	3	5	3256	1.6	38	--	--	
M-14	1100	496	8	13	3	5	1628	0.8	38	--	15' U.T. Br.	
L-1	2400	108	2	13	3	5	3552	1.8	38	--	--	
L-2	2600	136	2	13	3	5	3848	1.9	38	--	--	
Total-14	10,700						15,836	7.9				5247.00
M-15	9000	680	10	13	3	5	13,320	6.6	38	--	--	
M-15	1300	1640	22	13	3	5	1924	1.0	38	--	--	
M-15	700	1892	25	13	3	5	1036	0.5	38	--	--	
M-15	800	2088	27	13	3	5	1184	0.6	38	--	--	
M-15	500	2332	29	13	3	5	740	0.4	38	--	--	
L-1	5100	520	8	13	3	5	7548	3.7	38	--	--	
L-1	700	672	10	13	3	5	1036	0.5	38	--	--	
L-1	1200	900	13	13	3	5	1776	0.9	38	--	--	
L-2	2500	132	2	13	3	5	3700	1.8	38	--	--	
L-3	2600	188	3	13	3	5	3848	1.9	38	40' - 42"	--	
L-4	5600	240	4	13	3	5	8288	4.1	38	--	--	
L-5	3500	176	3	13	3	5	5180	2.6	38	--	30' - 36"	
											40' - 42"	
L-6	4100	228	4	13	3	5	6068	3.0	38	--	--	
Total-15	37,600						55,648	27.6				18,078.00
M-16	5000	360	6	13	3	5	7400	3.7	38	--	--	
Total-16	5000						7400	3.7				2220.00
M-17	6500	304	5	13	3	5	9620	4.8	38	--	30' - 36"	
Total-17	6500						9620	4.8				3304.00
M-18	6500	324	5	13	3	5	9620	4.8	38	--	30' - 42"	
Total-18	6500						9620	4.8				3388.00
M-19	2000	104	2	13	3	5	2960	1.5	38	--	--	
M-19	2500	372	6	13	3	5	3700	1.8	38	--	30' - 48"	
M-19	2300	536	9	13	3	5	3404	1.7	38	--	--	
M-19	2100	1644	22	13	3	5	3108	1.5	38	--	--	
M-19	5800	1964	25	13	3	5	8584	4.3	38	--	--	

ENGINEERING AND DESIGN DATA

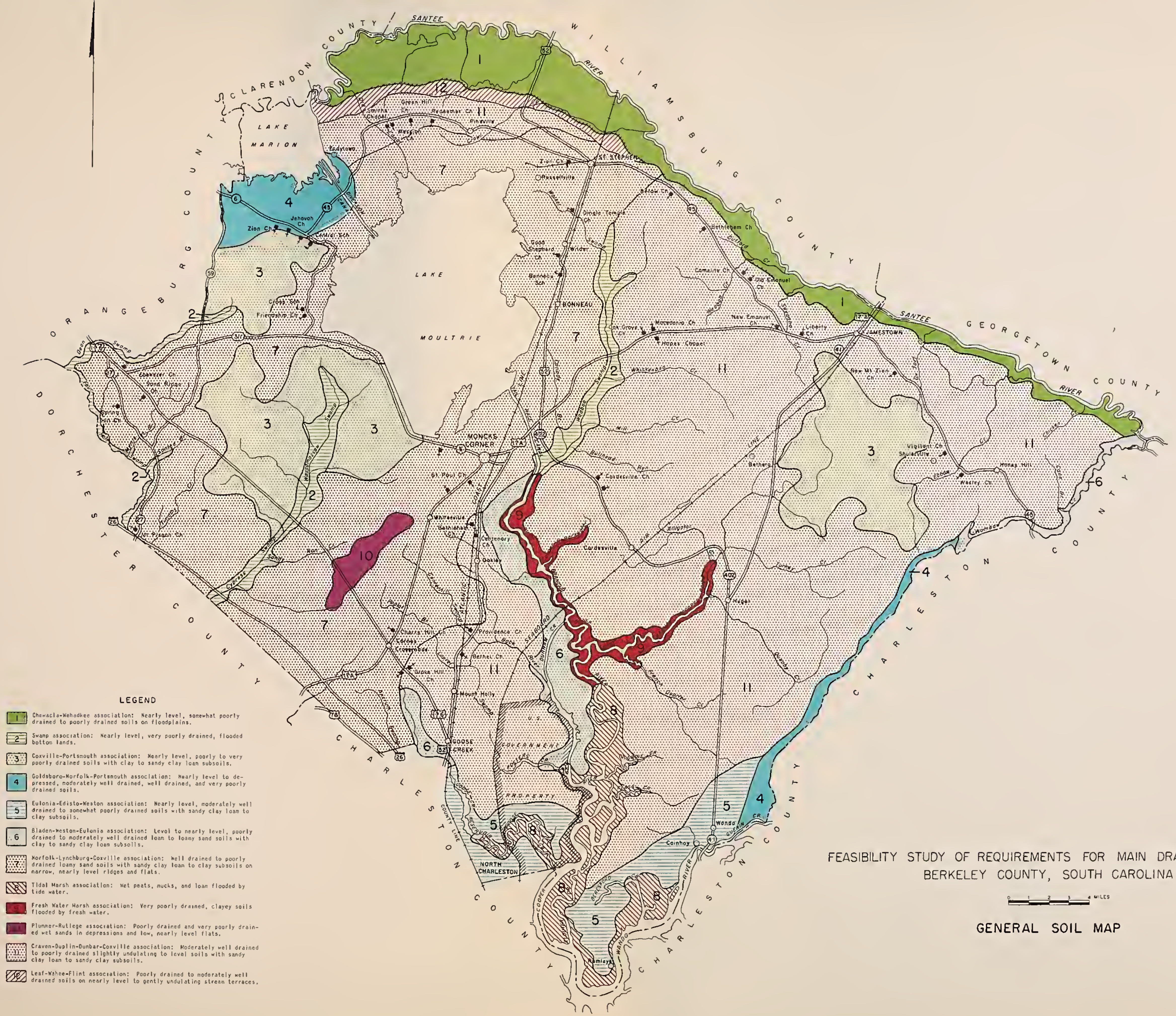
Area 13 - Pompion Chapel - Charity Church - Wando - Daniel's Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
L-1	2300	100	2	13	3	5	3404	1.7	38	--	--	
L-2	1500	44	1	13	3	5	2220	1.1	38	--	--	
L-3	9300	948	14	13	3	5	13,764	6.8	38	--	--	
Total-19	27,800						41,144	20.4				12,933.00
M-20	8700	224	4	13	3	5	12,876	6.4	38	--	40' - 42"	
Total-20	8700						12,876	6.4				4527.00
M-21	6500	428	7	13	3	5	9620	4.8	38	60' - 36"	--	
Total-21	6500						9620	4.8				3304.00
M-22	7400	340	5	13	3	5	10,952	5.4	38	--	--	
Total-22	7400						10,952	5.4				3270.00
M-23	4000	260	4	13	3	5	5920	2.9	38	--	--	
M-23	3900	584	9	13	3	5	5772	2.9	38	--	--	
L-1	2300	84	1	13	3	5	3404	1.7	38	--	--	
Total-23	10,200						15,096	7.5				4519.00
M-24	2700	104	2	13	3	5	3996	2.0	38	--	--	
M-24	2500	316	5	13	3	5	3700	1.8	38	--	--	
L-1	1500	52	1	13	3	5	2220	1.1	38	--	30' - 24"	
L-2	3200	64	1	13	3	5	4736	2.4	38	--	--	
Total-24	9900						14,652	7.3				4609.00
M-25	4500	384	6	13	3	5	6660	3.3	38	--	30' - 48"	
M-25	2100	484	8	13	3	5	3108	1.5	38	--	--	
L-1	1600	72	1	13	3	5	2368	1.2	38	--	--	
Total-25	8200						12,136	6.0				4251.00
M-26	4800	660	10	13	3	5	7104	3.5	38	--	--	
M-26	3600	1132	16	13	3	5	5328	2.6	38	--	15' R.C. Br.	
											15' R.C. Br.	
L-1	3700	248	4	13	3	5	5476	2.7	38	--	50' - 30"	
Total-26	12,100						17,908	8.8				8852.00
M-27	3900	212	3	13	3	5	5772	2.9	38	--	30' - 30"	
Total-27	3900						5772	2.9				2040.00
M-28	6200	536	9	13	3	5	9176	4.6	38	--	--	
M-28	2200	876	13	13	3	5	3256	1.6	38	--	15' R.C. Br.	
L-1	2900	208	3	13	3	5	4292	2.1	38	--	--	
Total-28	11,300						16,724	8.3				6505.00
M-29	6600	624	10	13	3	5	9768	4.8	38	--	15' C.T. Br.	
M-29	4400	792	12	13	3	5	6512	3.2	38	--	15' C.T. Br.	
L-1	2000	52	1	13	3	5	2960	1.5	38	--	--	
Total-29	13,000						19,240	9.5				7248.00
M-30	4300	224	4	13	3	5	6364	3.2	38	--	30' - 48"	
Total-30	4300						6364	3.2				2537.00
M-31	3400	112	11	13	3	5	5032	2.5	38	--	--	
Total-31	3400						5032	2.5				3016.00

ENGINEERING AND DESIGN DATA

Area 13 - Pompion Chapel - Charity Church - Wando - Daniel's Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-32	2800	120	11	13	3	5	4144	1.8	38	--	--	
M-32	700	252	20	13	3	5	1036	--	38	--	--	
L-1	2600	112	11	13	3	5	3848	1.5	38	--	20' - 18"	
Total-32	6100						9028	3.3				5266.00
M-33	3900	144	13	13	3	5	5772	1.1	38	--	--	
M-33	1600	312	24	13	3	5	2368	--	38	--	--	
L-1	2900	120	11	13	3	5	4292	2.1	38	--	30' - 30"	
Total-33	8400						12,432	3.2				5874.00
M-34	7400	296	23	13	3	5	10,952	2.4	38	--	30' - 18" 20' - 24"	
Total-34	7400						10,952	2.4				6240.00
Area 13 Grand Total	545,200						934,663	435.3				314,504.00



FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS
BERKELEY COUNTY, SOUTH CAROLINA

GENERAL SOIL MAP

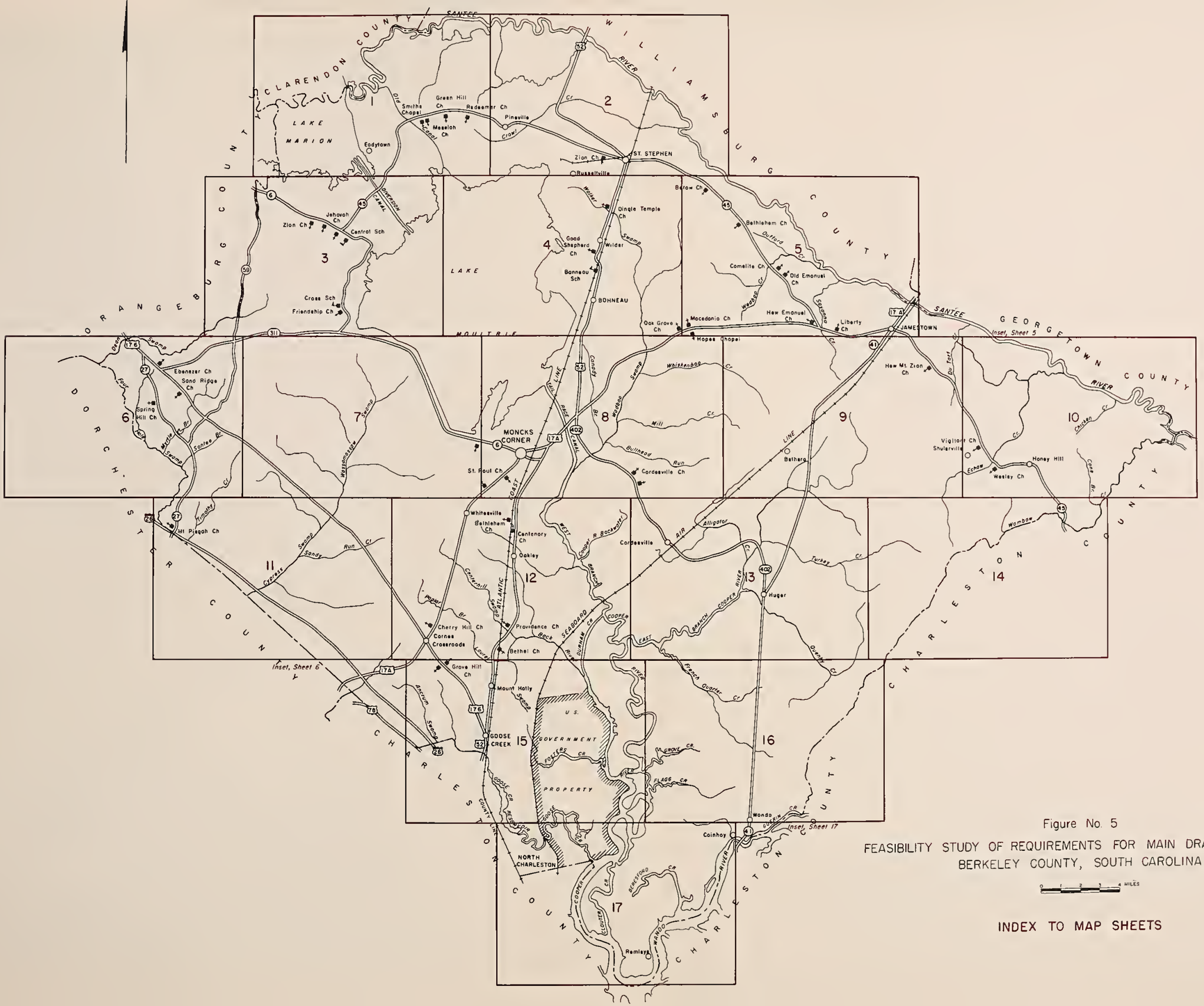


Figure No. 5

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS
BERKELEY COUNTY, SOUTH CAROLINA

0 1 2 3 4 MILES

INDEX TO MAP SHEETS

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

CONVENTIONAL SIGNS

———	Primary Road System
(26)	Interstate Highway
(17A)	Federal Highway
(45)	State Highway
	School
	Church
——— — — ———	County Line
——— -2- ———	Planning Unit Boundary and Number
— — — — — —	Watershed Boundary
M-1 →	Main
L-1 →	Lateral
— — — — →	Indicates existing canals or natural drainage in swamp

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a feasibility study of requirements for main ditch drainage canals in Berkeley County, South Carolina. The maps have been prepared in cooperation with Berkeley County Soil Conservation District and under the financial sponsorship of Berkeley County. For information regarding the complete feasibility study report, write the Soil Conservation Service, U. S. Department of Agriculture, Columbia, South Carolina. This map was compiled as an uncontrolled mosaic from aerial photographs flown in 1963. Maps were prepared and surveys executed in 1964.


N
WILLIAMSBURG COUNTY
SANTEE RIVER
SWAMP
SANTEE RIVER
ATLANTIC COAST LINE BOUNDARY
FRANCIS MARION NATIONAL FOREST
WILLIAMSBURG COUNTY
Redeemer Church
Pineville
J. K. Gourdin School
Russellville
Russellville School
ST. STEPHEN
Lake Moultrie
6
7
8
8
45
52
L-1
L-2
L-3
L-4
L-5
L-6
L-7
L-8
L-9
L-10
L-11
L-12
L-13
L-14
L-15
L-16
L-17
L-18
L-19
L-20
M-1
M-2
M-3
M-4
M-5
M-6
M-7
M-8
M-9
M-10
M-11
M-12
M-13
M-14
M-15
(Joins sheet 1)
(Joins sheet 4)
(Joins sheet 5)
0 1/2 1 Mile
Scale 1:50 000 (Approximate)
0 5000 Feet

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

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FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

(Joins sheet 1) | (Joins sheet 2)

(Joins sheet 3)

(Joins sheet 5)

(Joins sheet 7) | (Joins sheet 8)

N

Lake Moultrie

BOUNDARY LINE

FRANCIS MARION NATIONAL FOREST

ATLANTIC COAST

Wilder

Bonneau School

BONNEAU

White Point Beoch

M-1 M-2 M-3 M-4

L-1 L-2 L-3 L-4 L-5 L-6 L-7 L-8 L-9 L-10 L-11 L-12 L-13 L-14 L-15 L-16 L-17 L-18 L-19 L-20 L-21 L-22 L-23 L-24 L-25 L-26 L-27 L-28 L-29 L-30 L-31 L-32 L-33 L-34 L-35 L-36 L-37 L-38 L-39 L-40 L-42 L-43 L-44 L-45 L-47

52

Scale 1:50 000 (Approximate)

0 ½ 1 Mile

0 5000 Feet

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

5

N

(Joins sheet 2)

SANTEE RIVER

GEORGETOWN COUNTY

(Joins right below)

FRANCIS MARION NATIONAL FOREST

(Joins sheet 9) | (Joins sheet 10)

Alvin

Macedonia Church

Hopes Chapel

JAMESTOWN

SEABOARD AIR LINE

WILLIAMSBURG COUNTY

(Joins sheet 8) | (Joins sheet 9)

(Joins left above)

(Joins sheet 4)

sponsorship of Berkeley County. For information regarding the complete feasibility study report, write the Soil Conservation Service, U. S. Department of Agriculture, Columbia, South Carolina. This map was compiled as an uncontrolled mosaic from aerial photographs flown in 1963. Maps were prepared and surveys executed in 1964.

0 1/2 1 Mile

Scale 1:50 000 (Approximate)

0 5000 Feet

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

(6)

N

(Joins sheet 3)

(Joins sheet 11) (Joins sheet 12)

(Joins sheet 15)

(Joins sheet 7)

(Joins sheet 11)

176 — 311 — 27 — 26 — 17-A — 78

ORANGEBURG COUNTY

DORCHESTER COUNTY

CHARLESTON COUNTY

Four Hole Swamp

Ebenezer Church

Sand Ridge Church

Spring Hill Church

Poplar Hill Church & School

S. C. Department of Corrections

1 2 3 4

M-1 M-2 M-3 M-4 M-5 M-6 M-7 M-8 M-9 M-10 M-11 M-13

L-1 L-2 L-3 L-4 L-5 L-6

0 1/2 1 Mile

Scale 1:50 000 (Approximate)

0 5000 Feet

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

(Joins sheet 3) | (Joins sheet 4)

(Joins sheet 6)

(Joins sheet 8)

(Joins sheet 11) | (Joins sheet 12)

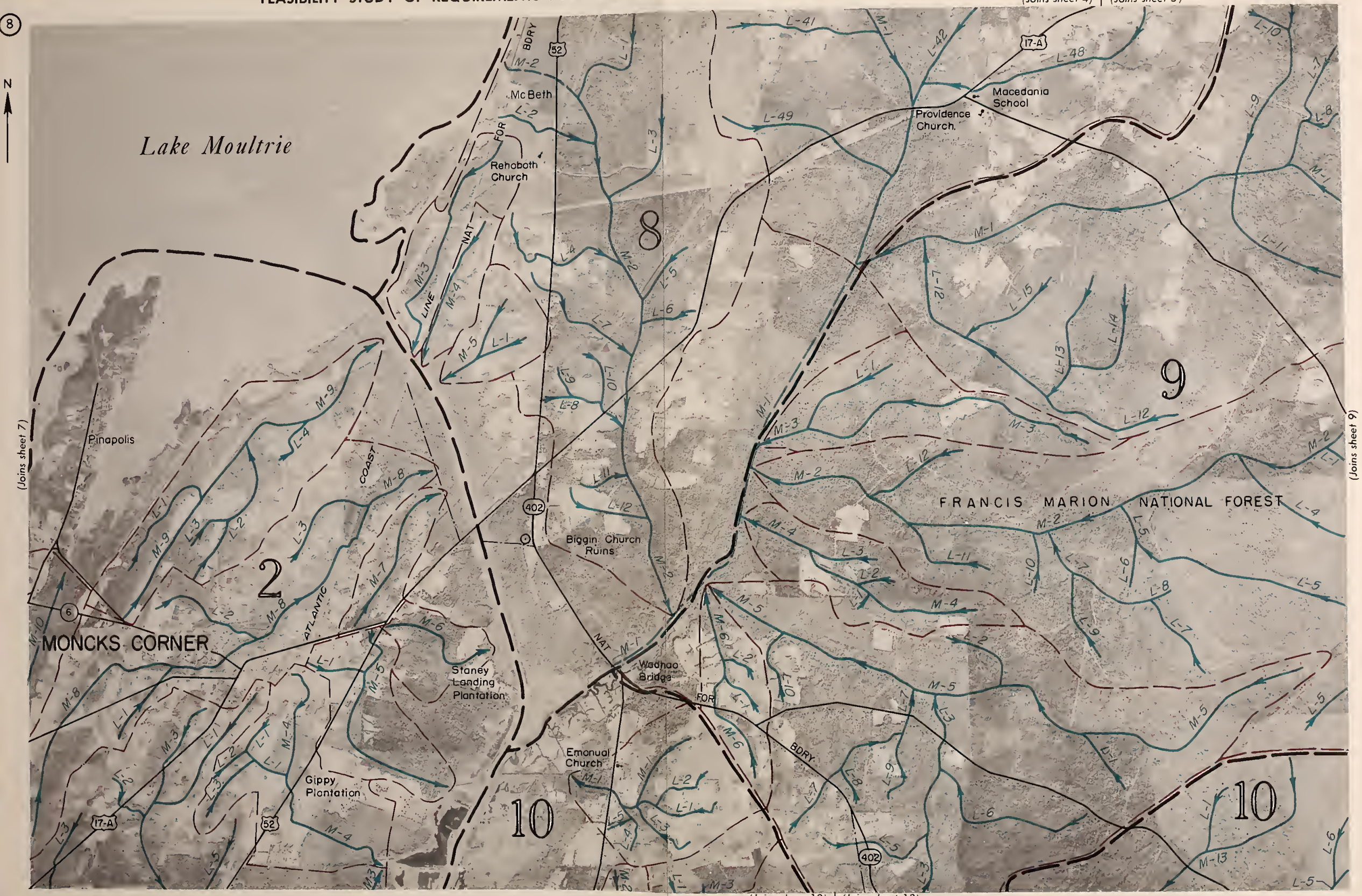
0 1/2 Mile Scale 1:50 000 (Approximate)

0 5000 Feet

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a feasibility study of requirements for main ditch drainage canals in Berkeley County, South Carolina. The maps have been prepared in cooperation with Berkeley County Soil Conservation District and under the financial sponsorship of Berkeley County. For information regarding the complete feasibility study report, write the Soil Conservation Service, U. S. Department of Agriculture, Columbia, South Carolina. This map was compiled as an uncontrolled mosaic from aerial photographs flown in 1963. Maps were prepared and surveys executed in 1964.

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

(Joins sheet 4) | (Joins sheet 5)



(Joins sheet 12) | (Joins sheet 13)

0 ½ 1 Mile

Scale 1:50 000 (Approximate)

0 5000 Feet

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

(Joins sheet 5) | (Joins inset, sheet 5)

(Joins sheet 8)

(Joins sheet 10)

(Joins sheet 13) | (Joins sheet 14)

9

N

WALLEYE BAY

LITTLE HELLHOLE BAY

FRANCIS MARION NATIONAL FOREST

Calstown Church

Bethera

Bethera Church

SEABOARD AIR LINE

7 9 10 11 12

17-A 41 45

0 1/2 1 Mile Scale 1:50 000 (Approximate)

0 5000 Feet

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a feasibility study of requirements for main ditch drainage canals in Berkeley County, South Carolina. The maps have been prepared in cooperation with Berkeley County Soil Conservation District and under the financial sponsorship of Berkeley County. For information regarding the complete feasibility study report, write the Soil Conservation Service, U. S. Department of Agriculture, Columbia, South Carolina. This map was compiled as an uncontrolled mosaic from aerial photographs flown in 1963. Maps were prepared and surveys executed in 1964.

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

(10)

(Joins inset sheet 5)

N

(Joins sheet 9)

GEORGETOWN COUNTY

SANTEE RIVER

11

FRANCIS MARION NATIONAL FOREST

Shulerville

Honey Hill

Honey Hill Church

Wambaw Creek

CHARLESTON COUNTY

45

L-6 L-23 L-22 L-22 L-22 L-24 L-21 M-3 L-20 M-4 L-1 M-5 L-1 M-4 M-6 L-3 M-7 L-2 L-2 M-7 L-1 M-3 L-19 L-18 L-15 L-14 L-14 L-17 M-3 L-8 L-9 L-13 L-12 L-11 L-11 M-9 M-8 L-5 L-4 L-4 L-1 L-2 L-3 M-8 L-7 L-10

(Joins sheet 14)

0 1/2 1 Mile

Scale 1:50 000 (Approximate)

0 5000 Feet

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

(Joins sheet 6)

(Joins sheet 7)

N

S. C. Department of Corrections

Wossamassaw Church

Lebanon Church

New Hope Church

Swamp

(Existing)

Cypress

DORCHESTER COUNTY

4

3

1

L-1 L-2 L-3 L-4 L-5 L-6 L-7

M-1 M-2 M-3 M-4 M-5 M-6 M-7 M-8 M-9 M-10 M-11 M-12 M-13 M-15 M-16

L-35 L-36 L-37 L-38

176

27

26

(Joins sheet 12)

(Joins inset, sheet 6)

0 1/2 1 Mile Scale 1:50 000 (Approximate)

0 5000 Feet

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FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

(12)

(Joins sheet 7) | (Joins sheet 8)

N

(Joins sheet 11)

(Joins sheet 13)

(Joins inset, sheet 6) | (Joins sheet 15)

0 1/2 Mi

Scale 1:50 000 (Approximate)

0 5000 Feet

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

(Joins sheet 8) | (Joins sheet 9)

N

9

10

12

13

Cordesville

Headquarters Santee Experiment Forest

Huger Bridge

Irwin Chapel

Eccles Church

Pompion Church

Richmond Plantation

Huger

Beckwith Pond Church

FRANCIS MARION NATIONAL FOREST

AIR LINE

SEABOARD

COOPER RIVER

BRANCH

EAST

NAT FOR

BDRY

402

41

(Joins sheet 12)

(Joins sheet 14)

(Joins sheet 15) | (Joins sheet 16)

0 1/2 1 Mile Scale 1:50 000 (Approximate) 0 5000 Feet

sponsorship of Berkeley County. For information regarding the complete feasibility study report, write the Soil Conservation Service, U. S. Department of Agriculture, Columbia, South Carolina. This map was compiled as an uncontrolled mosaic from aerial photographs flown in 1963. Maps were prepared and surveys executed in 1964.

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

(Joins sheet 9)

(Joins sheet 10)

14

N

(Joins sheet 13)

(Joins sheet 16)

0 1/2 1 Mile

Scale 1:50 000 (Approximate)

0 5000 Feet

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

(Joins sheet 12) | (Joins sheet 13) 15

(Joins inset, sheet 6)

Ancrum Swamp

Mount Holly
Chapel of our Savior

GOOSE CREEK
Howe Hall School

St. James Church

Goose Creek School

Cypress Gardens

Medway Plantation

U. S. GOVERNMENT PROPERTY

U. S. GOVERNMENT PROPERTY BOUNDARY

BACK RIVER

COOPER RIVER

Bushy Park Site

U. S. Naval Ammunition Depot

Red Bank Landing

COAST LINE

SEABOARD AIR LINE

ATLANTIC

CHARLESTON COUNTY

L-1 L-2 L-3 L-4 L-5 L-6 L-7 L-8 L-9 L-10 L-11 L-12 L-13 L-14 L-15

M-6 M-8 M-9 M-10 M-11 M-12 M-13 M-14 M-15 M-16 M-17

17-A 176 52 78 26

1 13 13

N

0 1/2 1 Mile Scale 1:50 000 (Approximate) 0 5000 Feet

(Joins sheet 16)

(Joins sheet 17)

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FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BERKELEY COUNTY, SOUTH CAROLINA

(Joins sheet 15) | (Joins sheet 16)

(Joins upper right)

(Joins sheet 16)

(Joins lower left)

17

N

ATLANTIC COAST LINE

Dike

M-18

M-18

M-18

U. S. GOVT PROP BDRY

SAL

U. S. GOVT PROP BDRY

Yeomans Hall Club

1

U. S. GOVERNMENT PROPERTY

U. S. GOVT PROP BDRY

CHARLESTON COUNTY

13 NATIONAL FOREST

41

RIVER

WANDO

CHARLESTON COUNTY

M-17

M-18

M-19

M-20

L-1

L-2

L-3

M-21

M-22

M-23

M-24

M-25

M-25

L-1

L-2

FOR L BDRY

Cainhoy

CREEK

BERESFORDS

13

NOBELS

M-31

M-34

Ralston Cr

CR

RIVER

CHARLESTON COUNTY

COOPER

DANIEL

L-1

M-32

M-33

L-1

ISLAND

RIVER

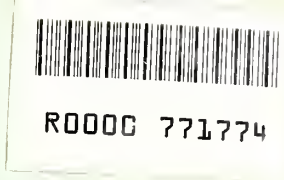
WANDO

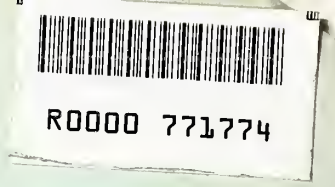
0 1/2 Mile

Scale 1:50 000 (Approximate)

0 5000 Feet

Columbia, South Carolina. This map was compiled as an uncontrolled mosaic from aerial photographs flown in 1963. Maps were prepared and surveys executed in 1964. For a complete feasibility study report, write the Soil Conservation Service, U. S. Department of Agriculture,


R0000 771774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